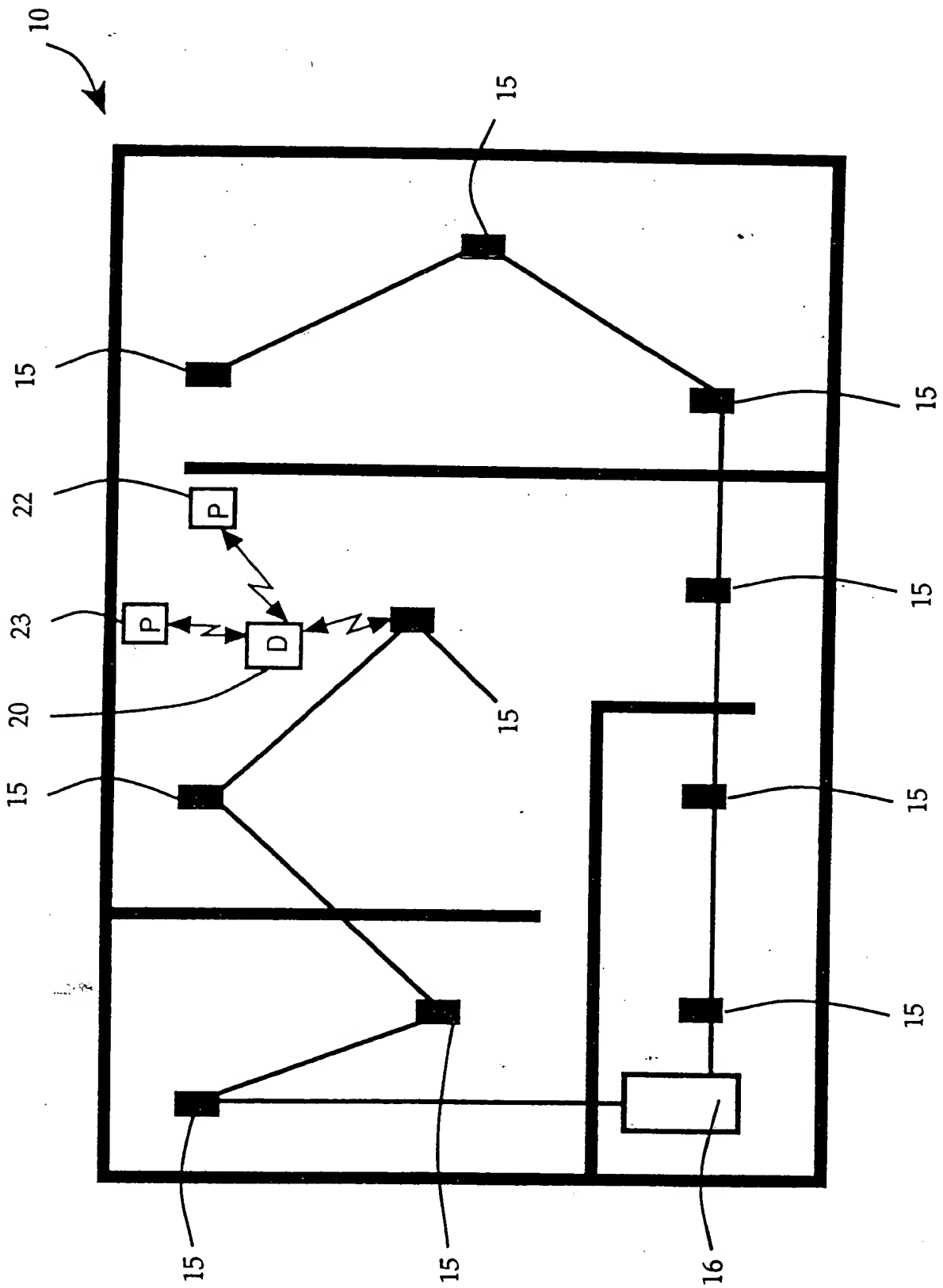


Figure 1a

86h080" 8hh62T60

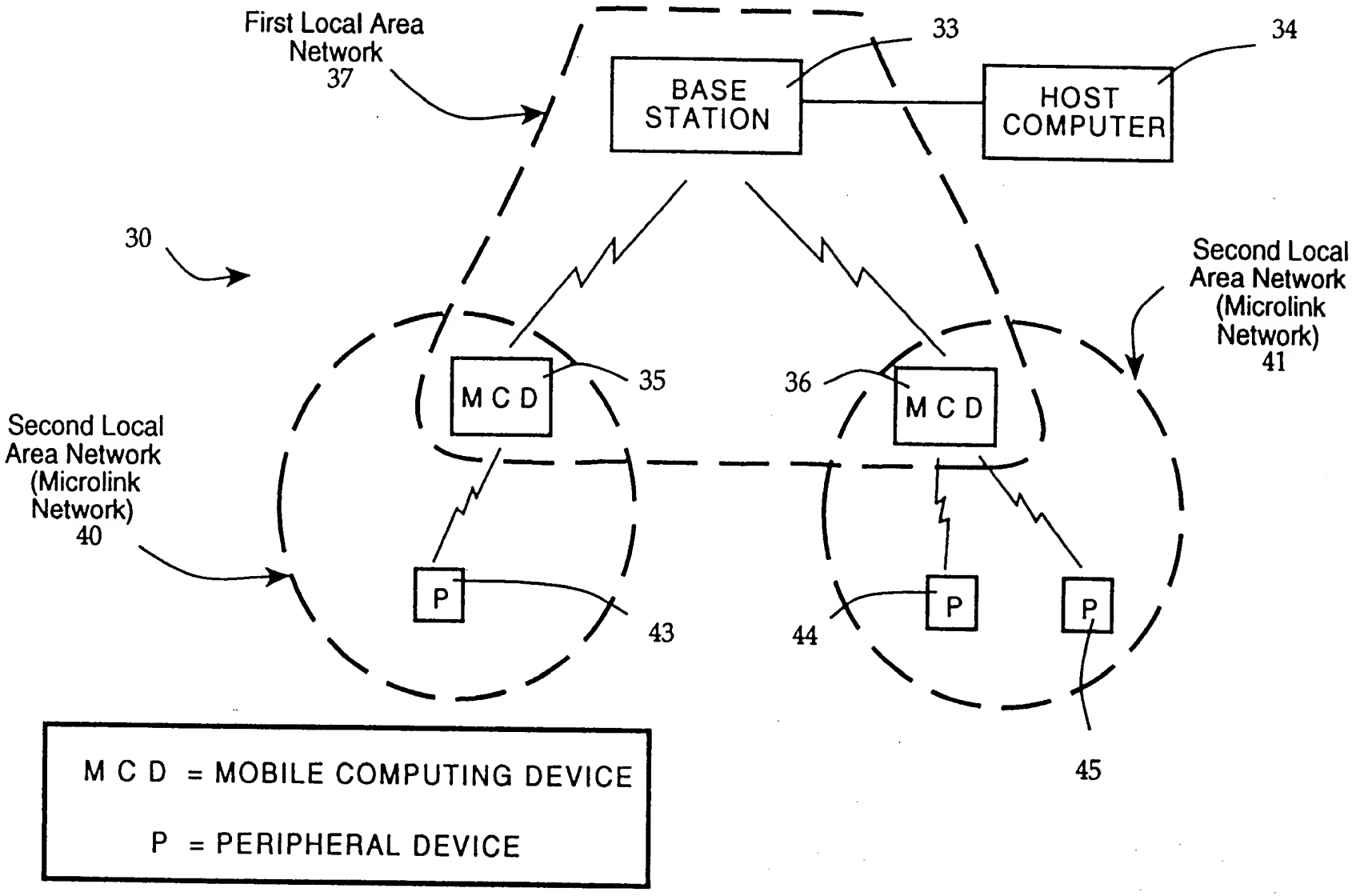


Figure 1b

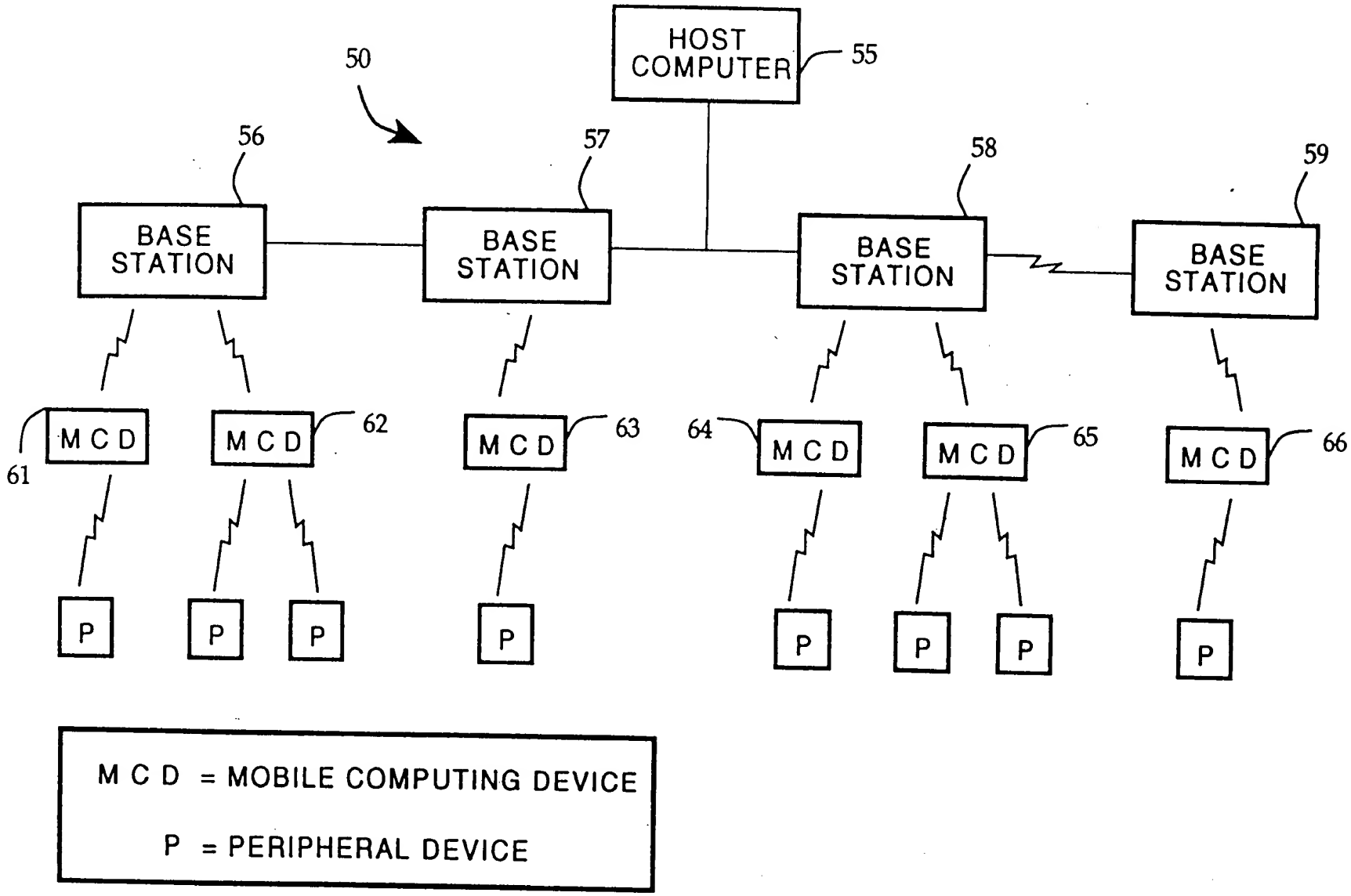

HOST COMPUTER
55
50
56
57
58
59
BASE STATION
BASE STATION
BASE STATION
BASE STATION
MCD
61
MCD
62
MCD
63
MCD
64
MCD
65
MCD
66
P
P
P
P
P
P
P
P
MCD = MOBILE COMPUTING DEVICE
P = PERIPHERAL DEVICE

Figure 1c

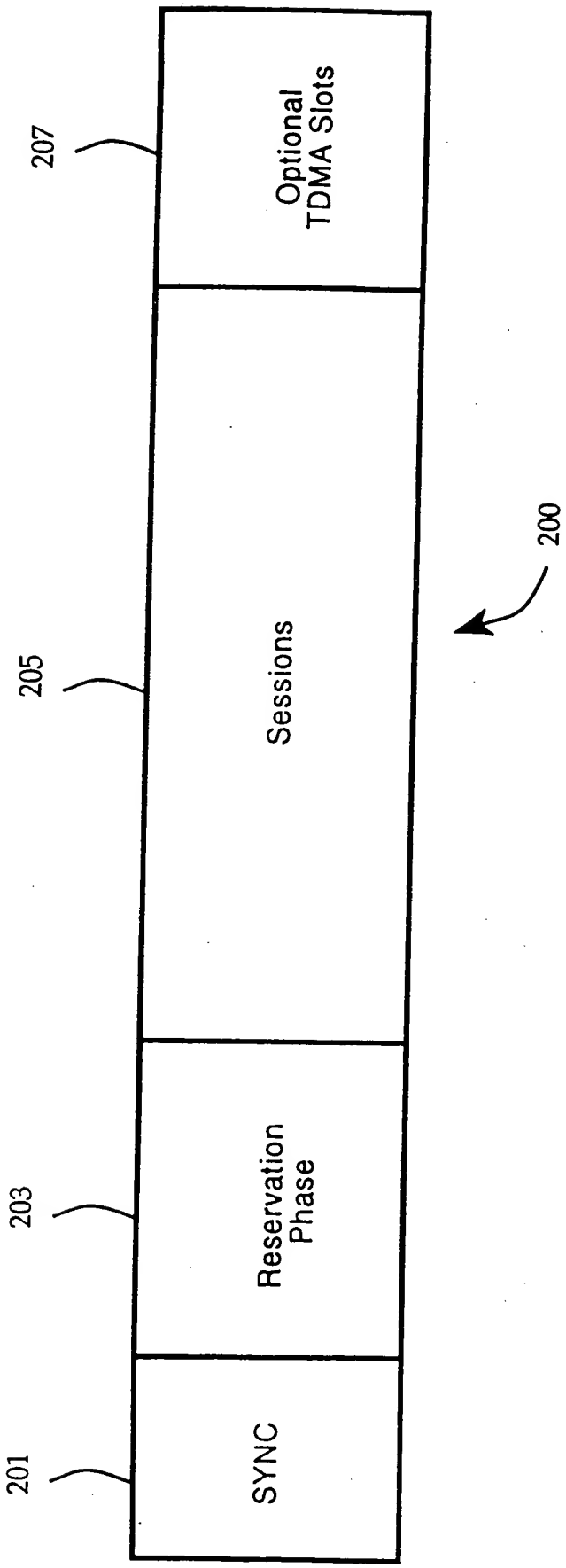

Optional TDMA Slots
207
Sessions
205
200
Reservation Phase
203
SYNC
201

Figure 2

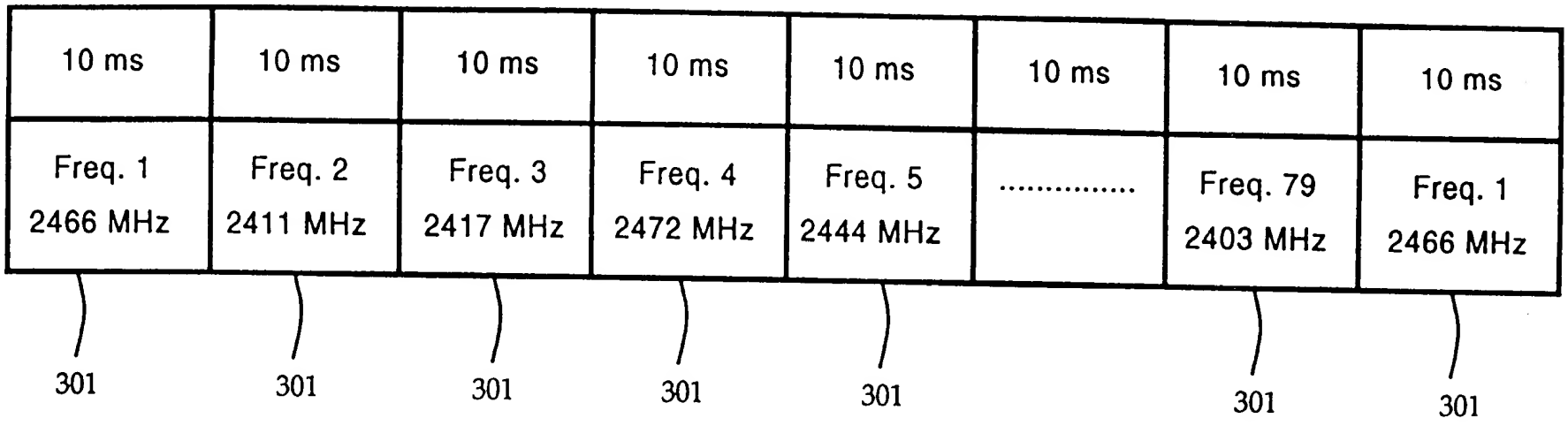


Figure 3a

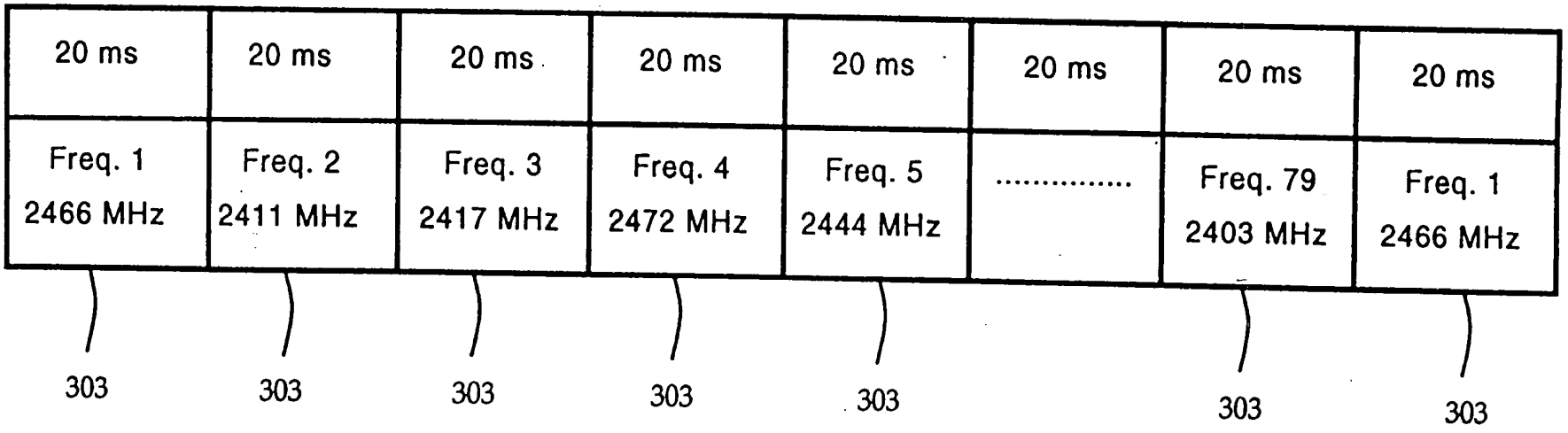


Figure 3b

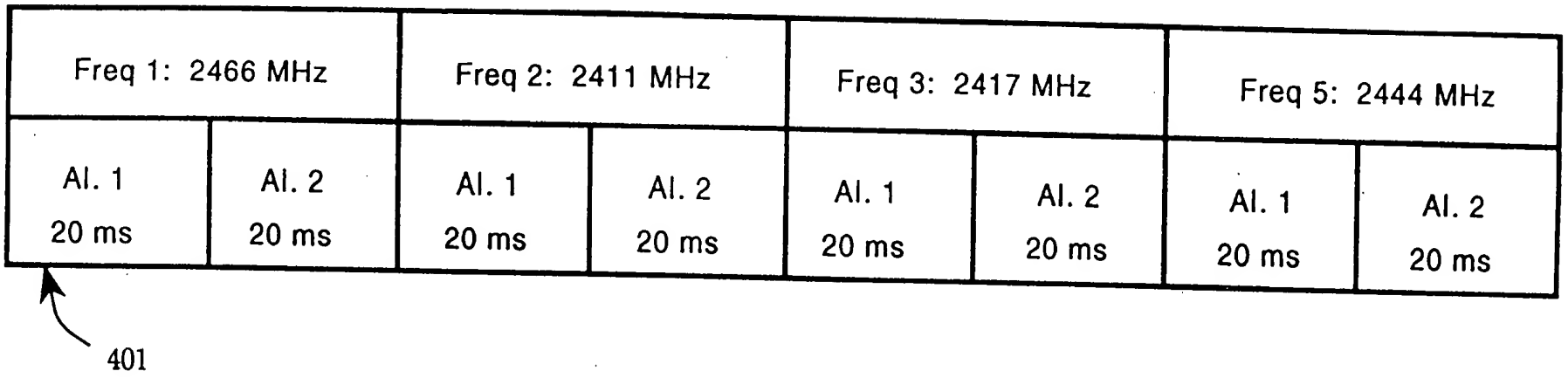


Figure 4a

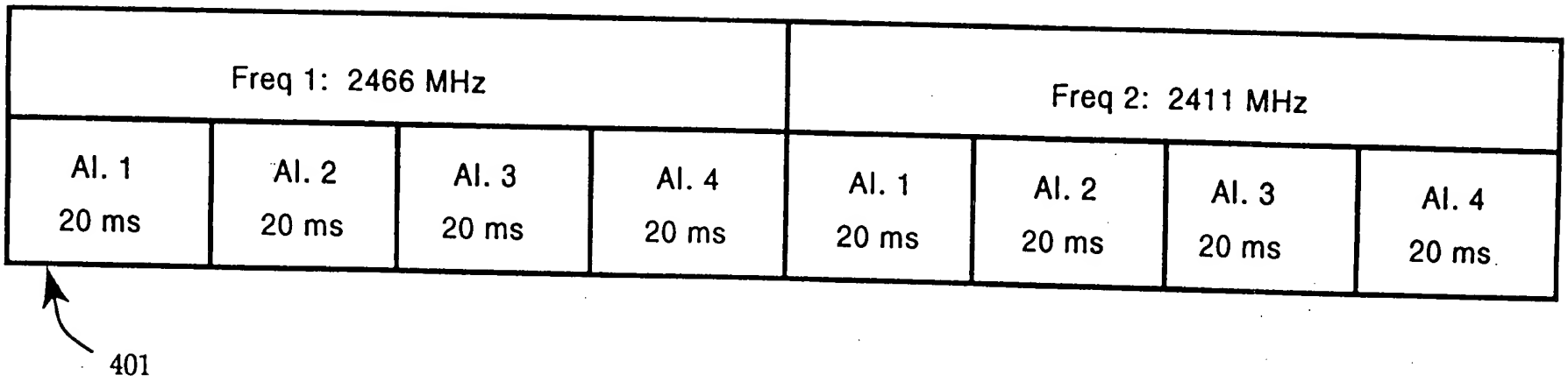


Figure 4b

86h080" 8hh62T60

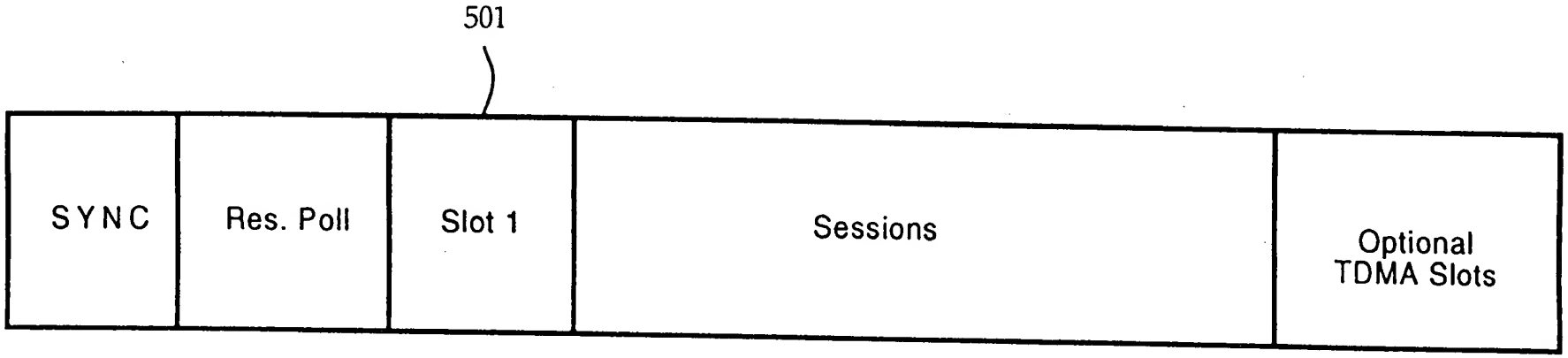


Figure 5a

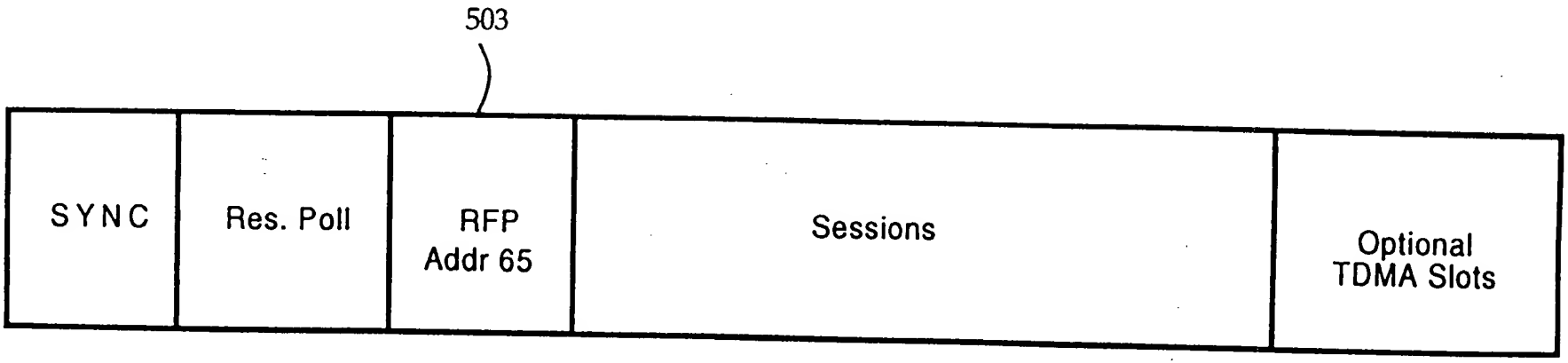


Figure 5b

86h080" 8hh62T60

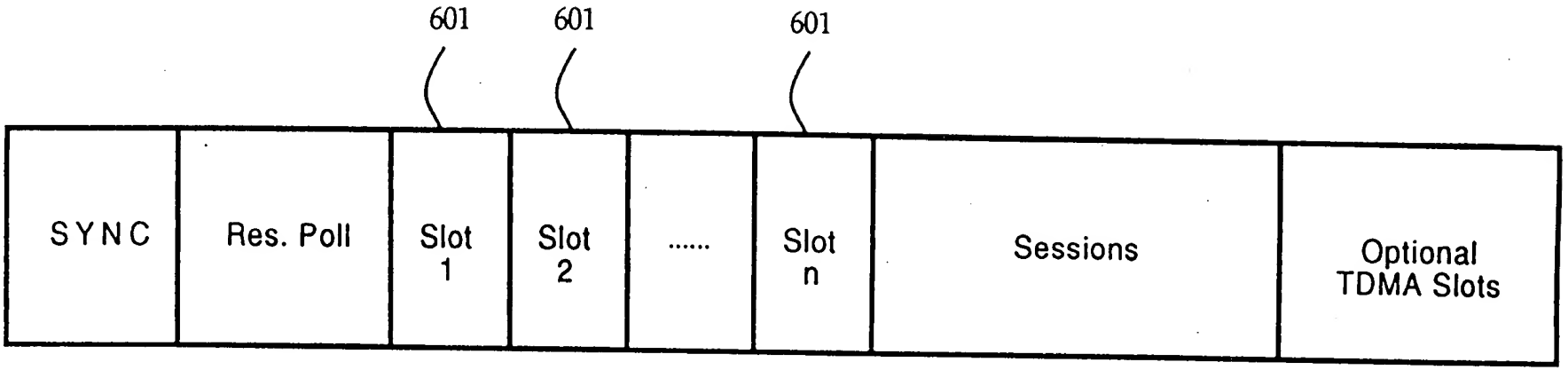


Figure 6a

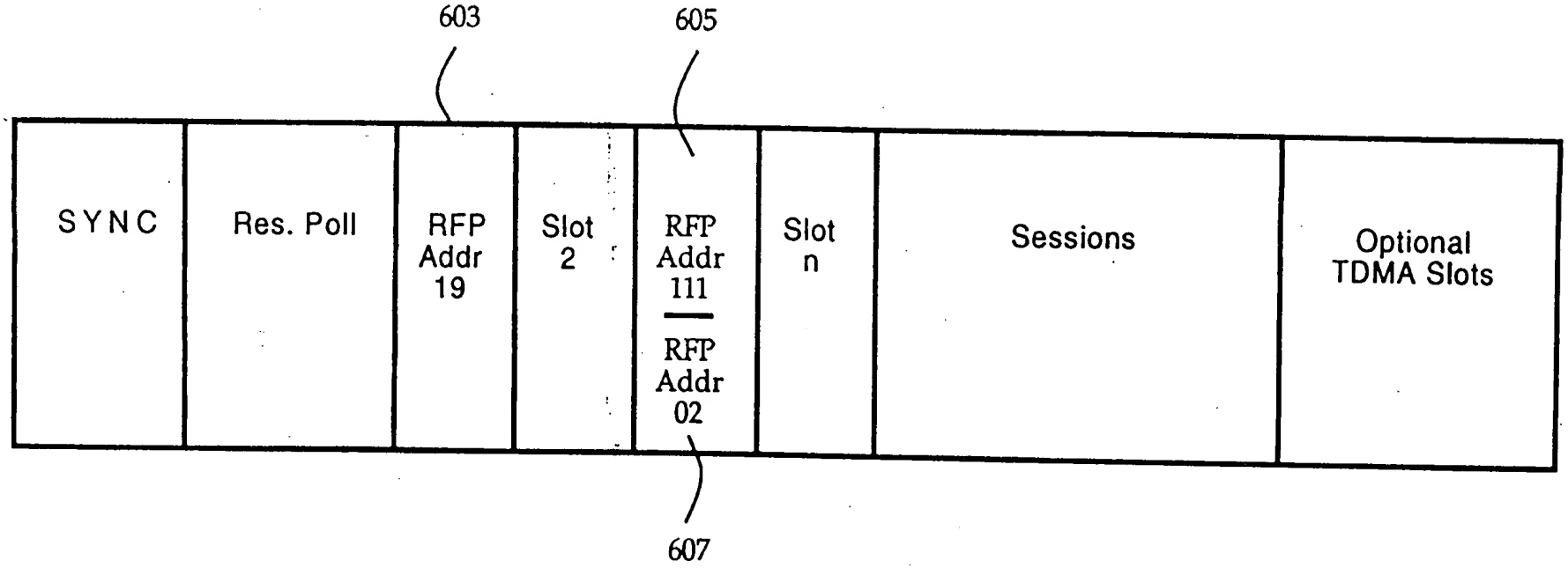


Figure 6b

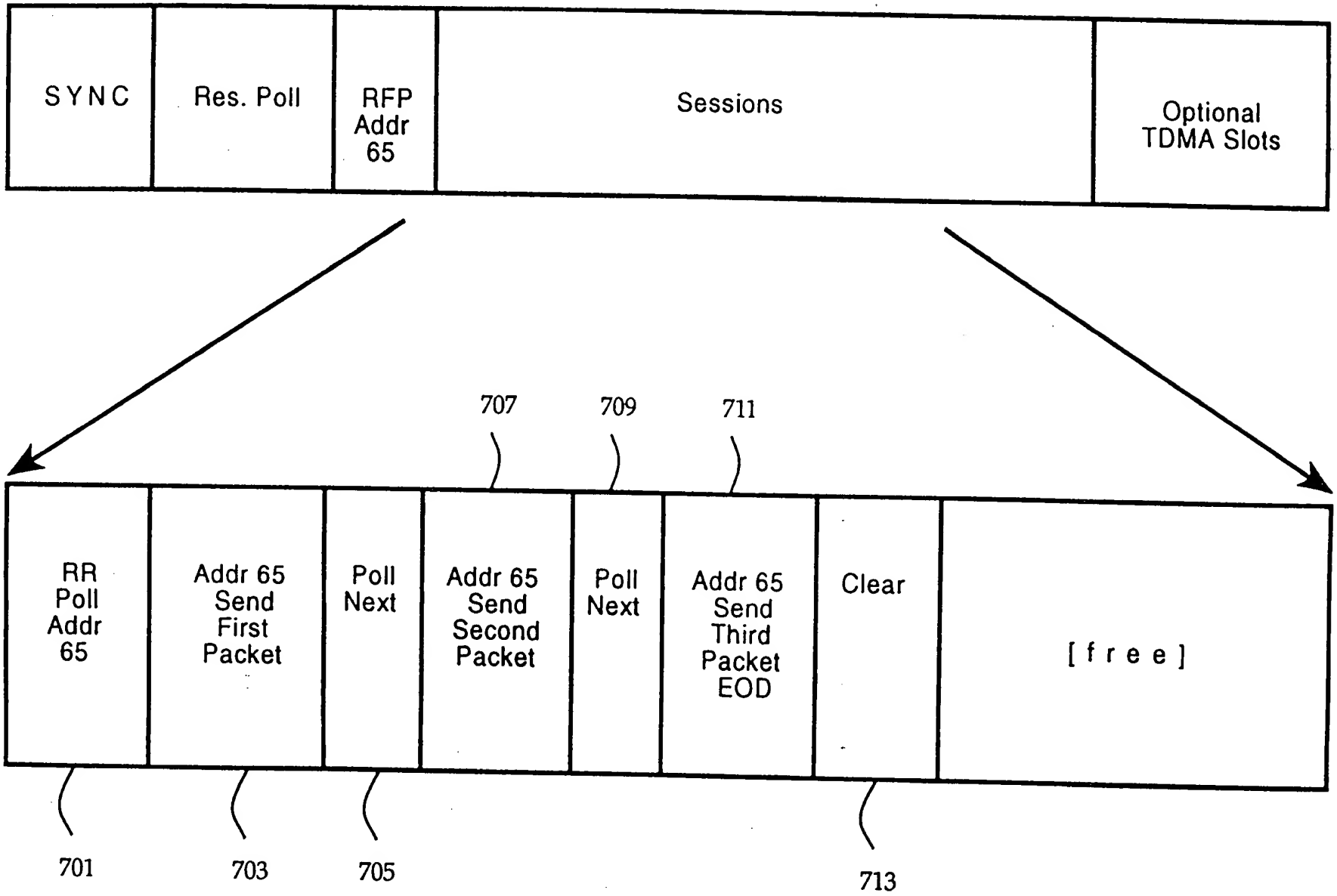

SYNC
Res. Poll
RFP Addr 65
Sessions
Optional TDMA Slots
707
709
711
RR Poll Addr 65
Addr 65 Send First Packet
Poll Next
Addr 65 Send Second Packet
Poll Next
Addr 65 Send Third Packet EOD
Clear
[f r e e]
701
703
705
713

Figure 7a

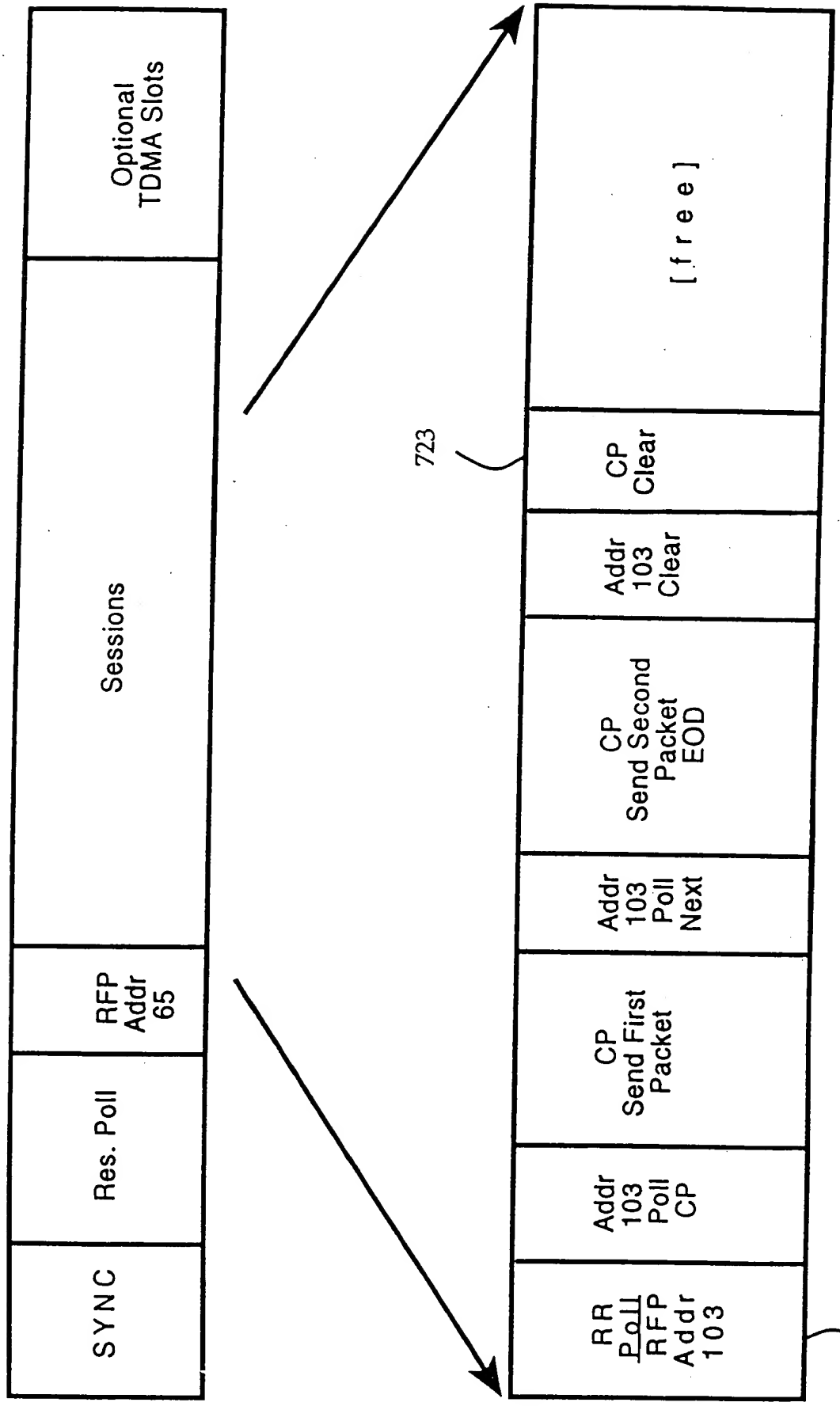

SYNC
Res. Poll
RFP Addr 65
Sessions
Optional TDMA Slots
RR Poll RFP Addr 103
Addr 103 Poll CP
CP Send First Packet
Addr 103 Poll Next
CP Send Second Packet EOD
Addr 103 Clear
CP Clear
[f r e e]
721
723

Figure 7b

WO 00/62560 PCT/US00/09080

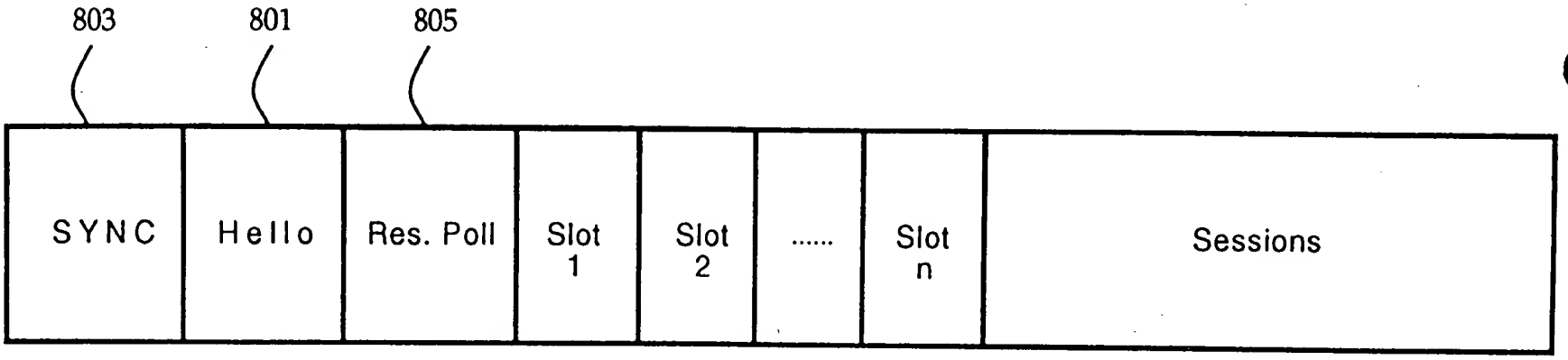


Figure 8

86h080" 8hh62T60

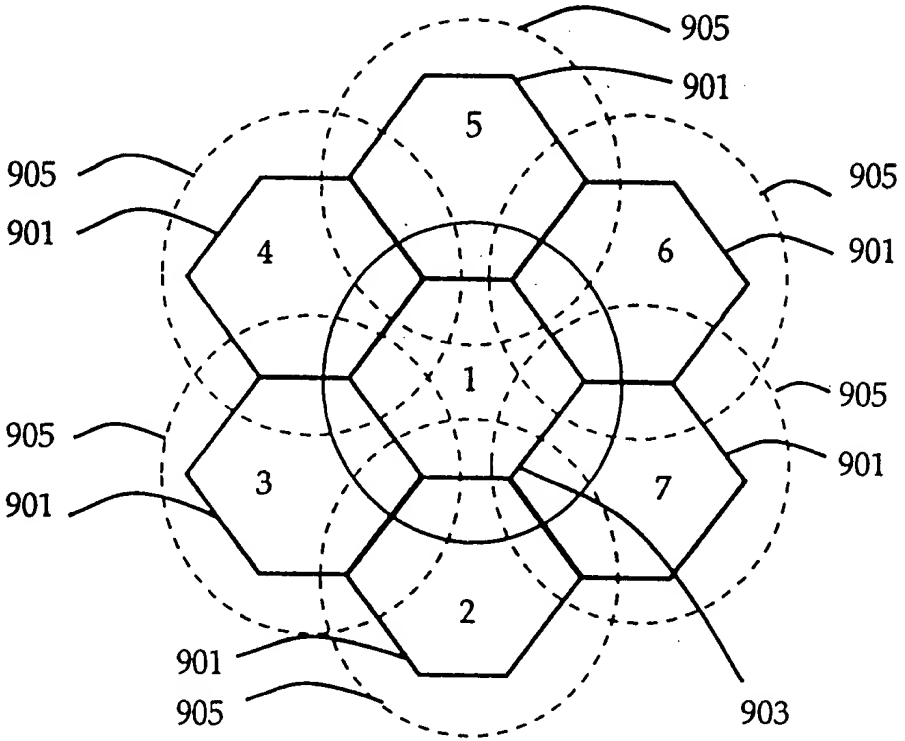


Figure 9a

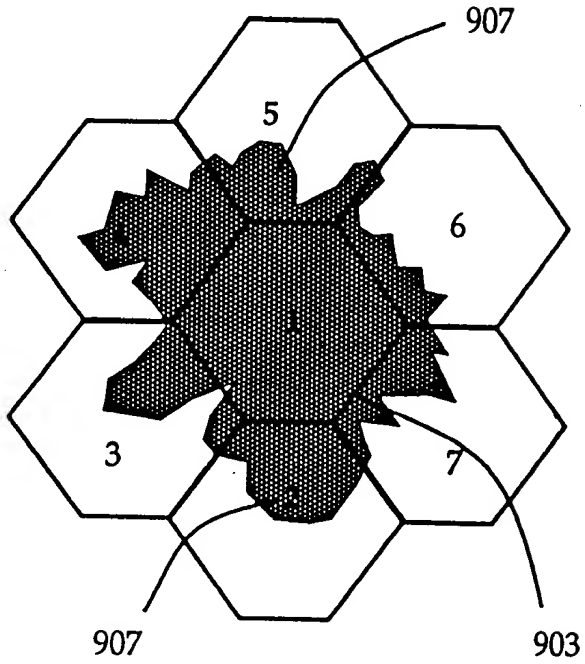


Figure 9b

86h080" 8hh62T60

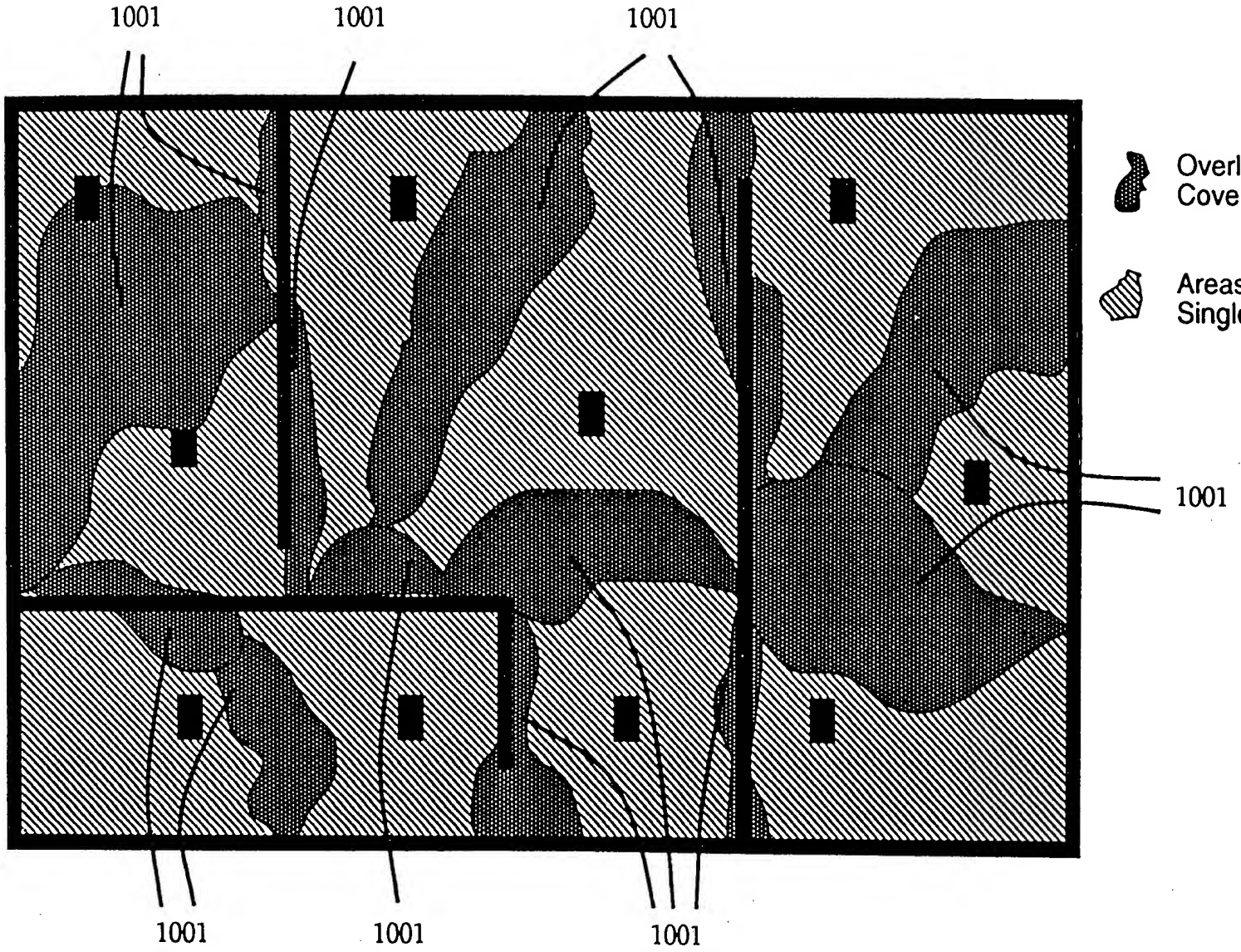


Figure 10

86h080"8hh62T60

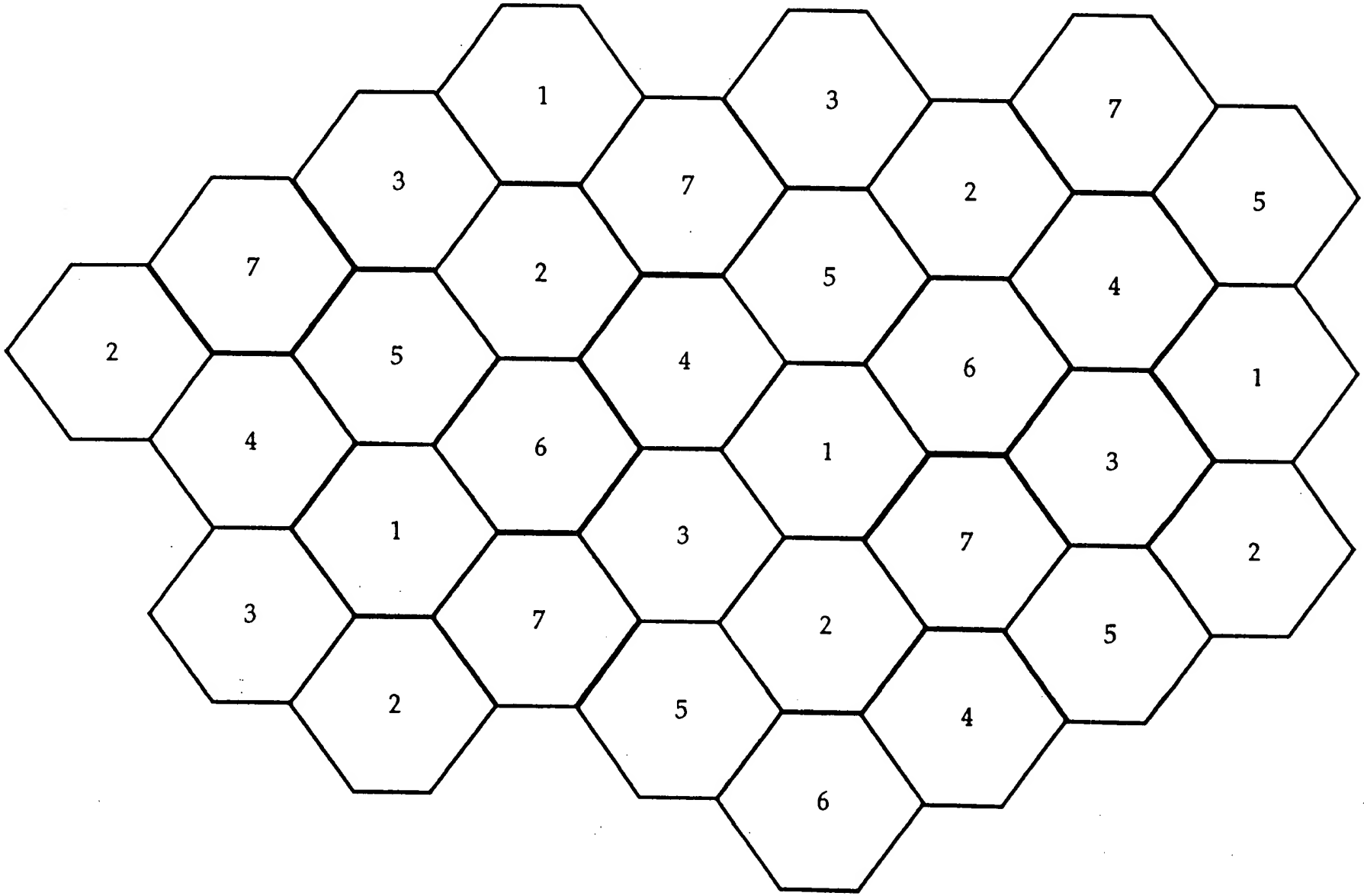


Figure 11

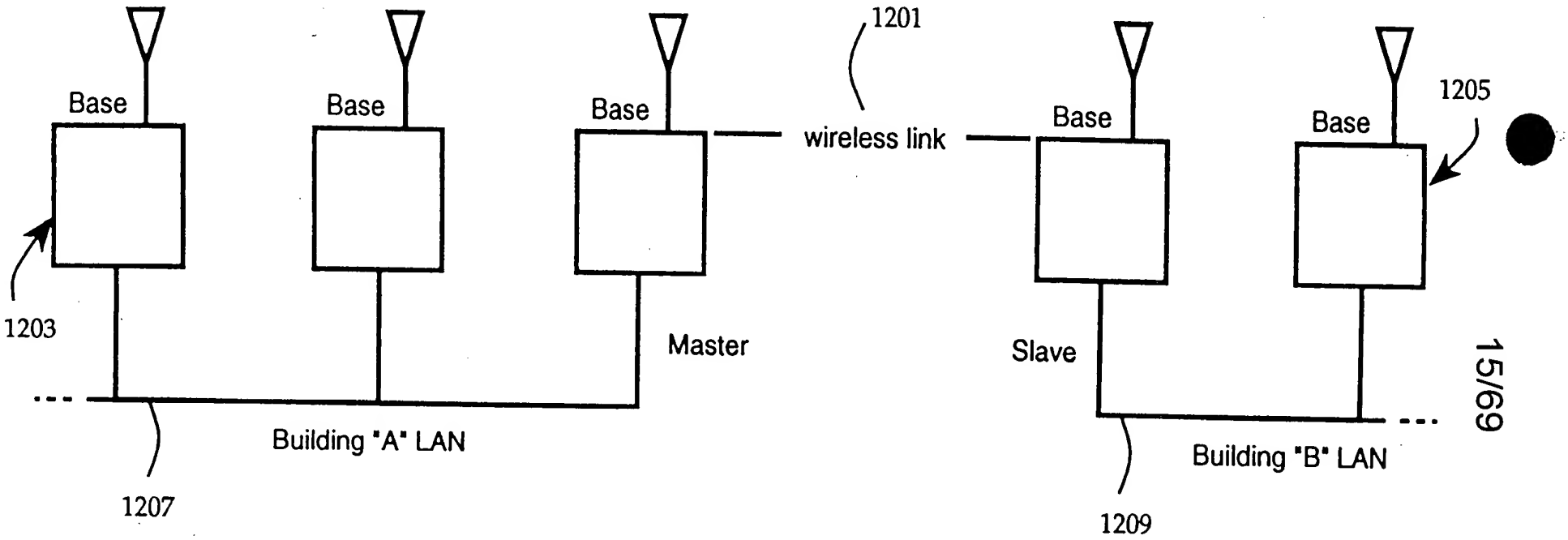

Base
Base
Base
1201
wireless link
Base
Base
1205
1203
Master
Slave
Building "A" LAN
Building "B" LAN
1207
1209

Figure 12

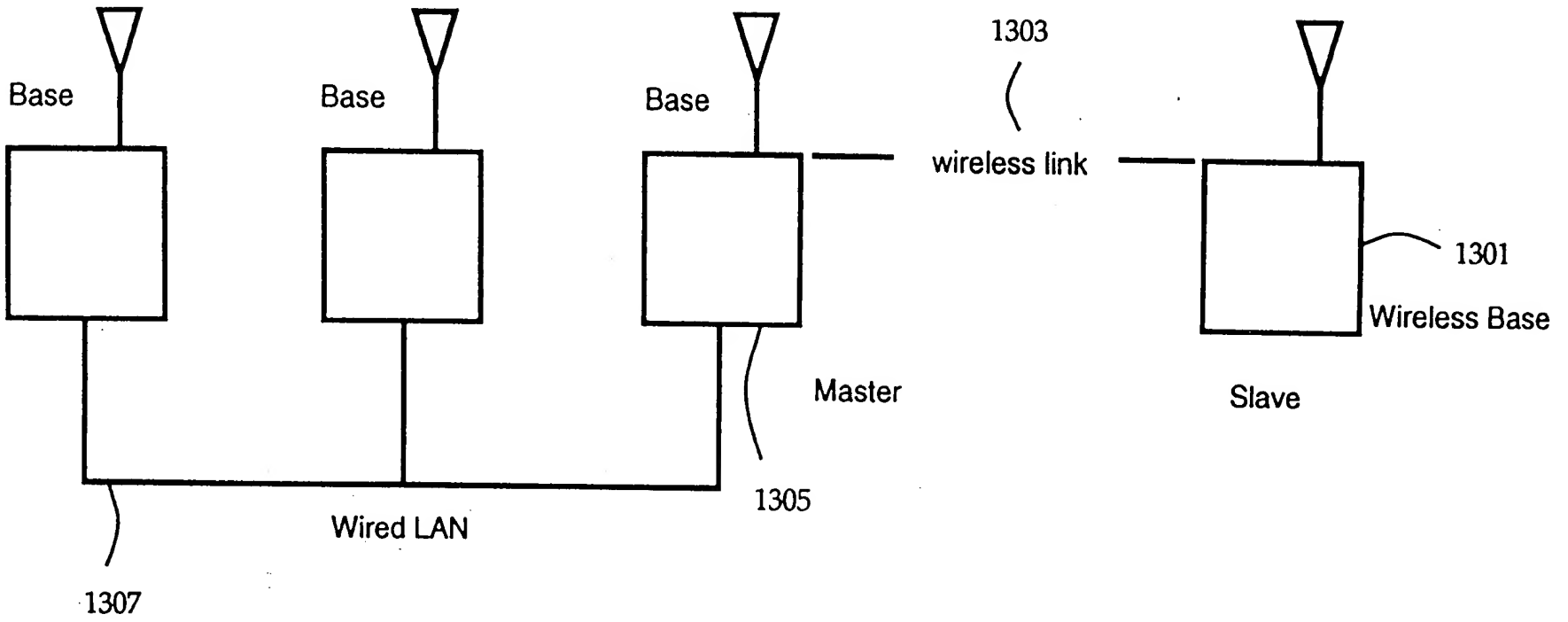

Base
Base
Base
1303
wireless link
1301
Wireless Base
Master
Slave
1305
Wired LAN
1307

Figure 13

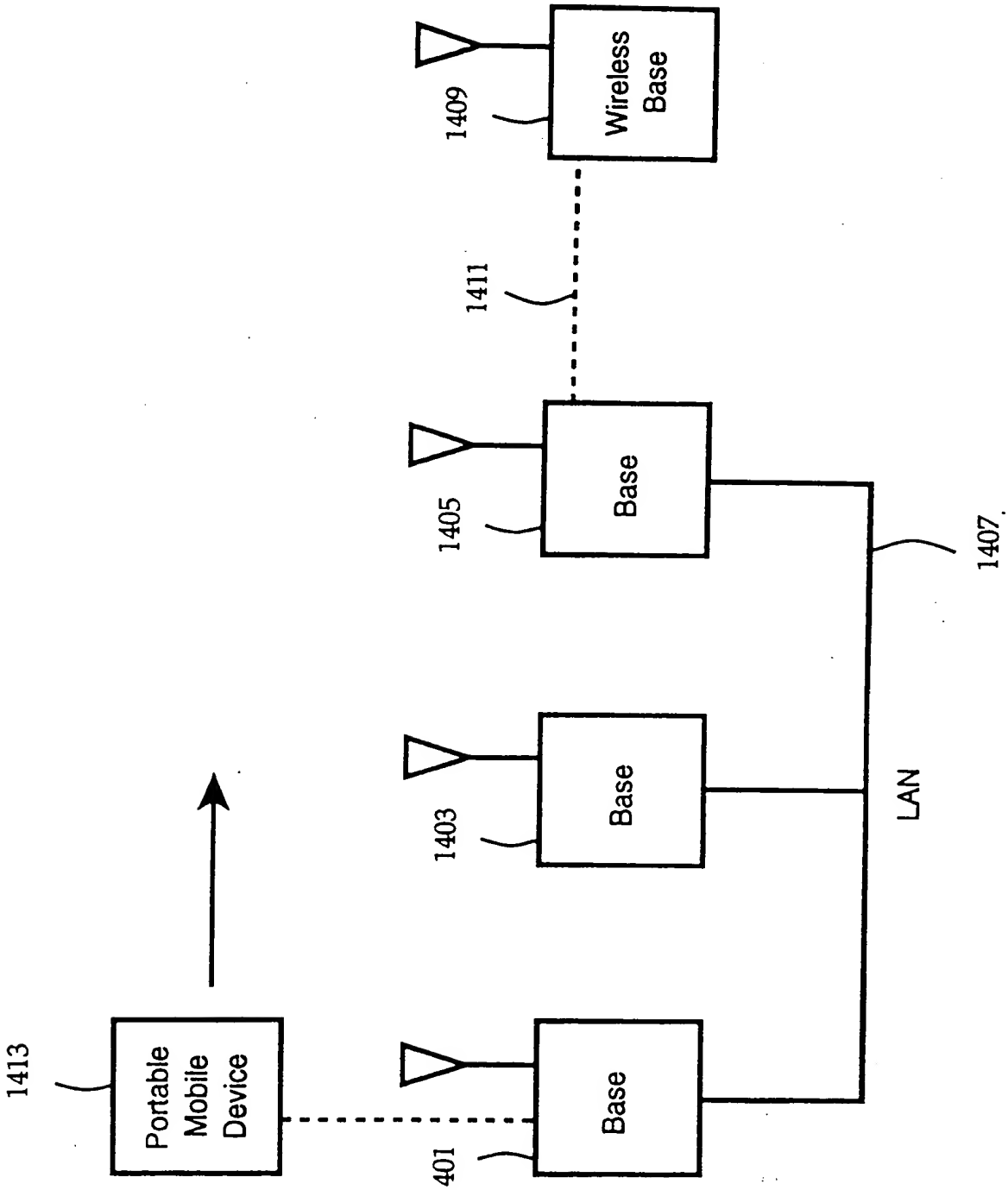

Wireless Base
1409
1411
Base
1405
Base
1403
Base
1401
LAN
1407
Portable Mobile Device
1413

Figure 14

86h080"8hh62T60

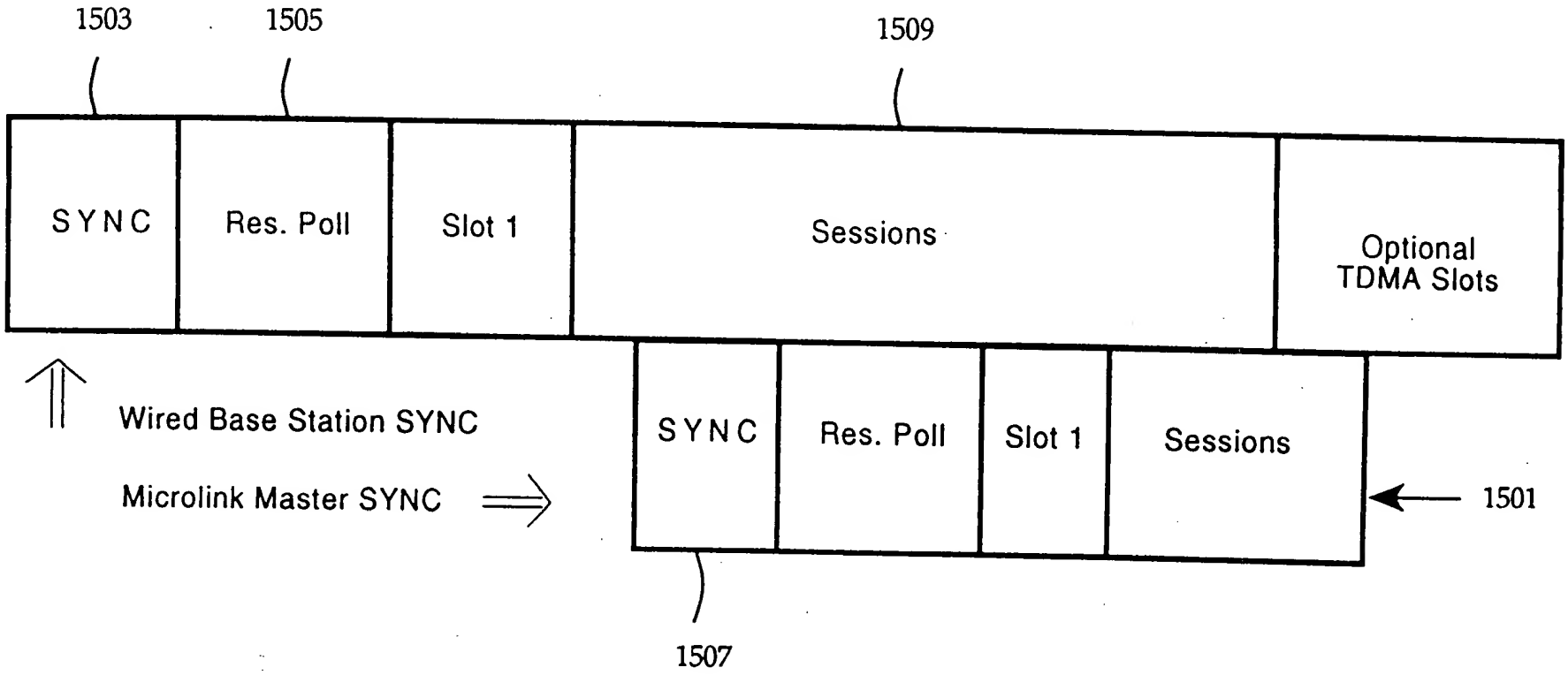


Figure 15

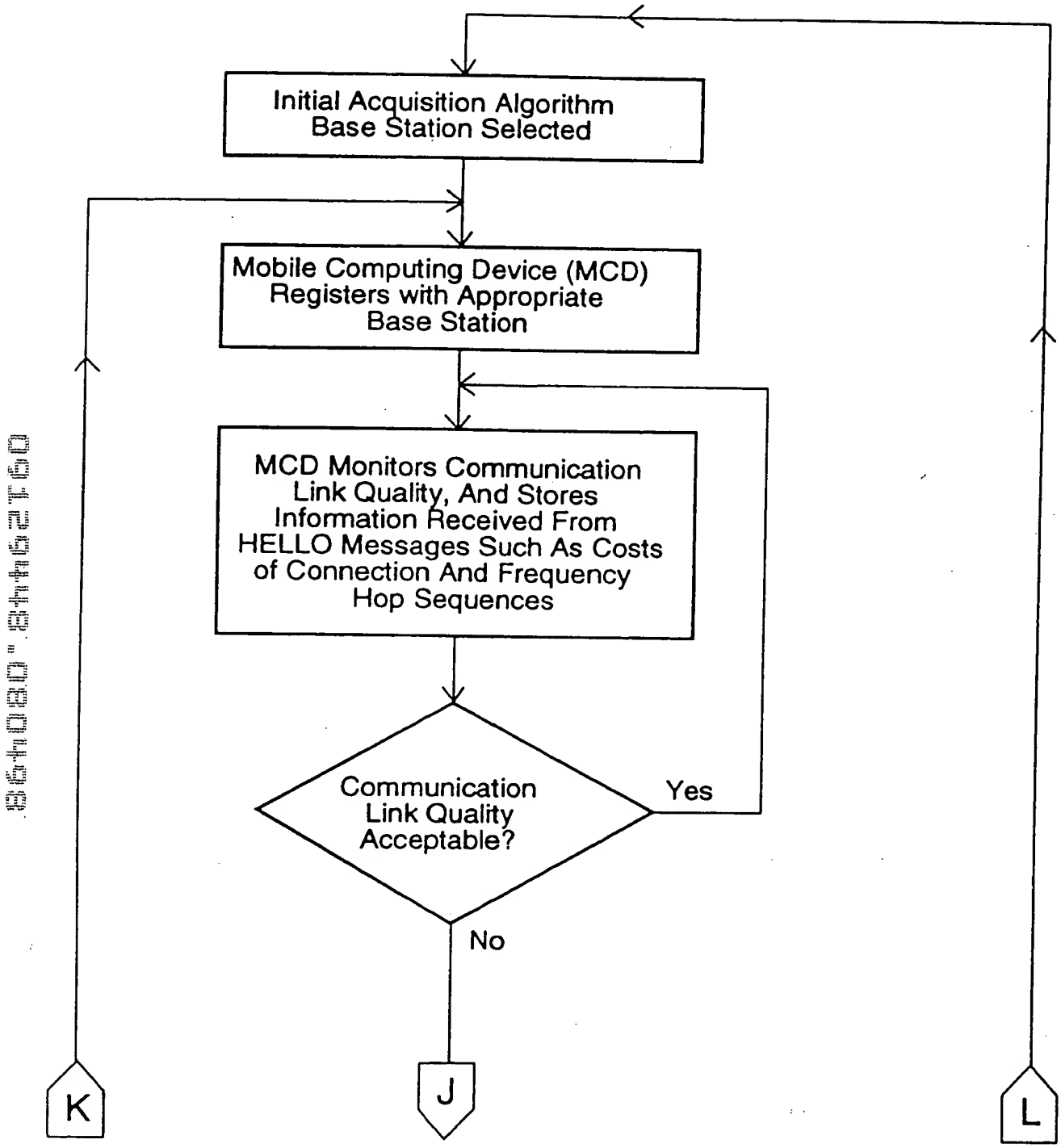

Initial Acquisition Algorithm
Base Station Selected
Mobile Computing Device (MCD)
Registers with Appropriate
Base Station
MCD Monitors Communication
Link Quality, And Stores
Information Received From
HELLO Messages Such As Costs
of Connection And Frequency
Hop Sequences
Communication
Link Quality
Acceptable?
Yes
No
K
J
L

Figure 16a

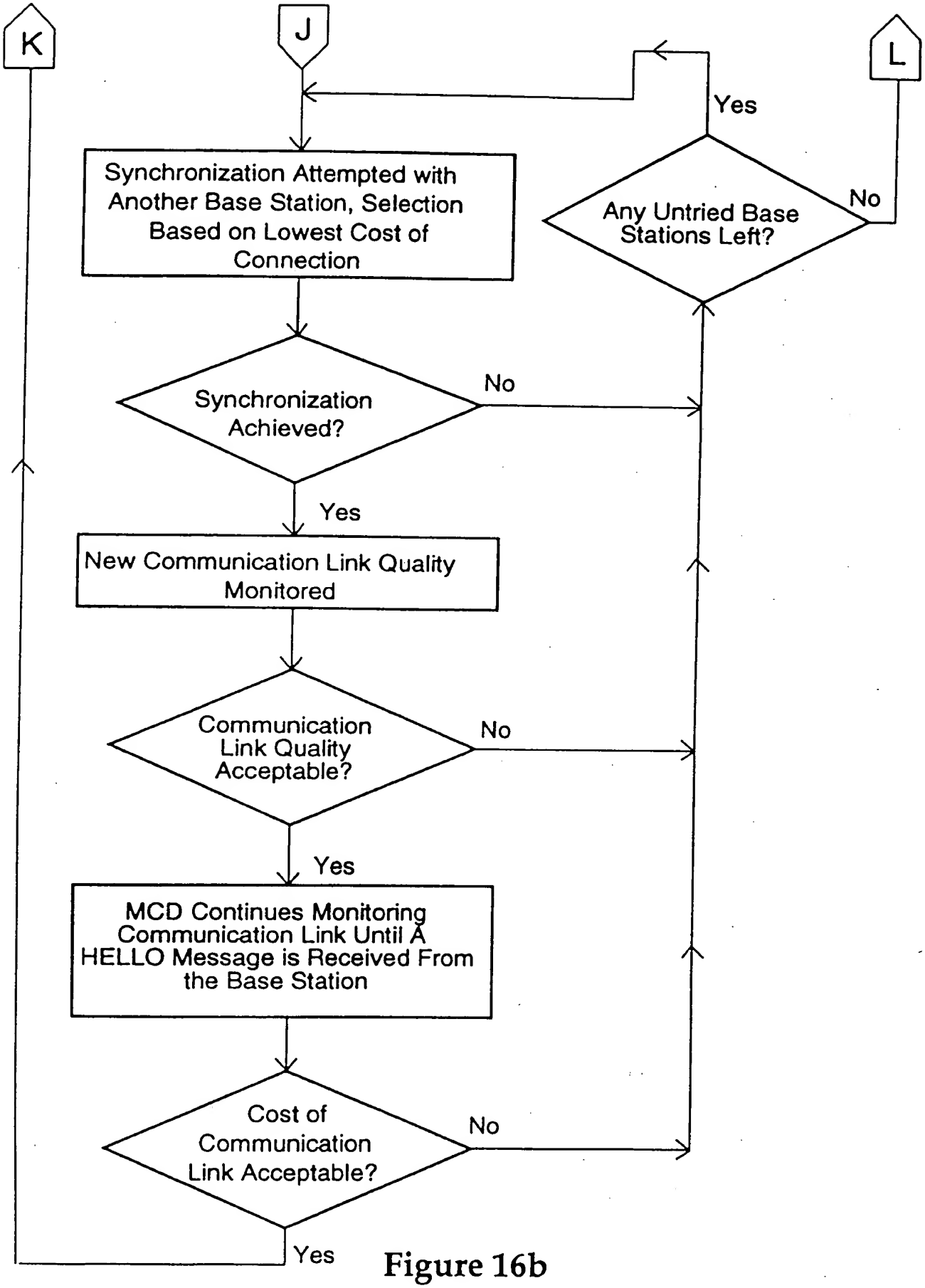


Figure 16b

09/529,468 - 08/05/98

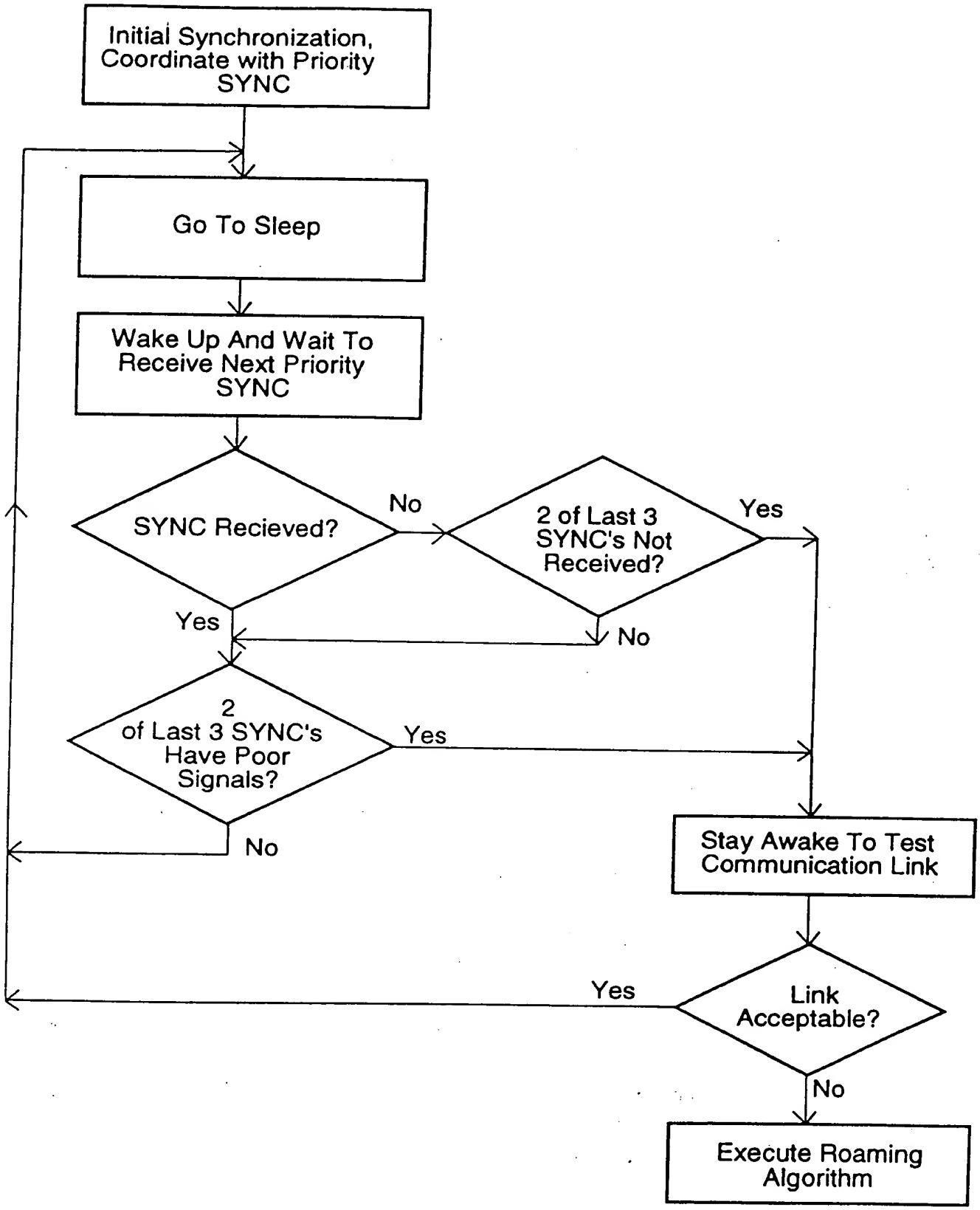

Initial Synchronization, Coordinate with Priority SYNC
Go To Sleep
Wake Up And Wait To Receive Next Priority SYNC
SYNC Recieved?
No
2 of Last 3 SYNC's Not Received?
Yes
Yes
No
2 of Last 3 SYNC's Have Poor Signals?
Yes
No
Stay Awake To Test Communication Link
Yes
Link Acceptable?
No
Execute Roaming Algorithm

Figure 17

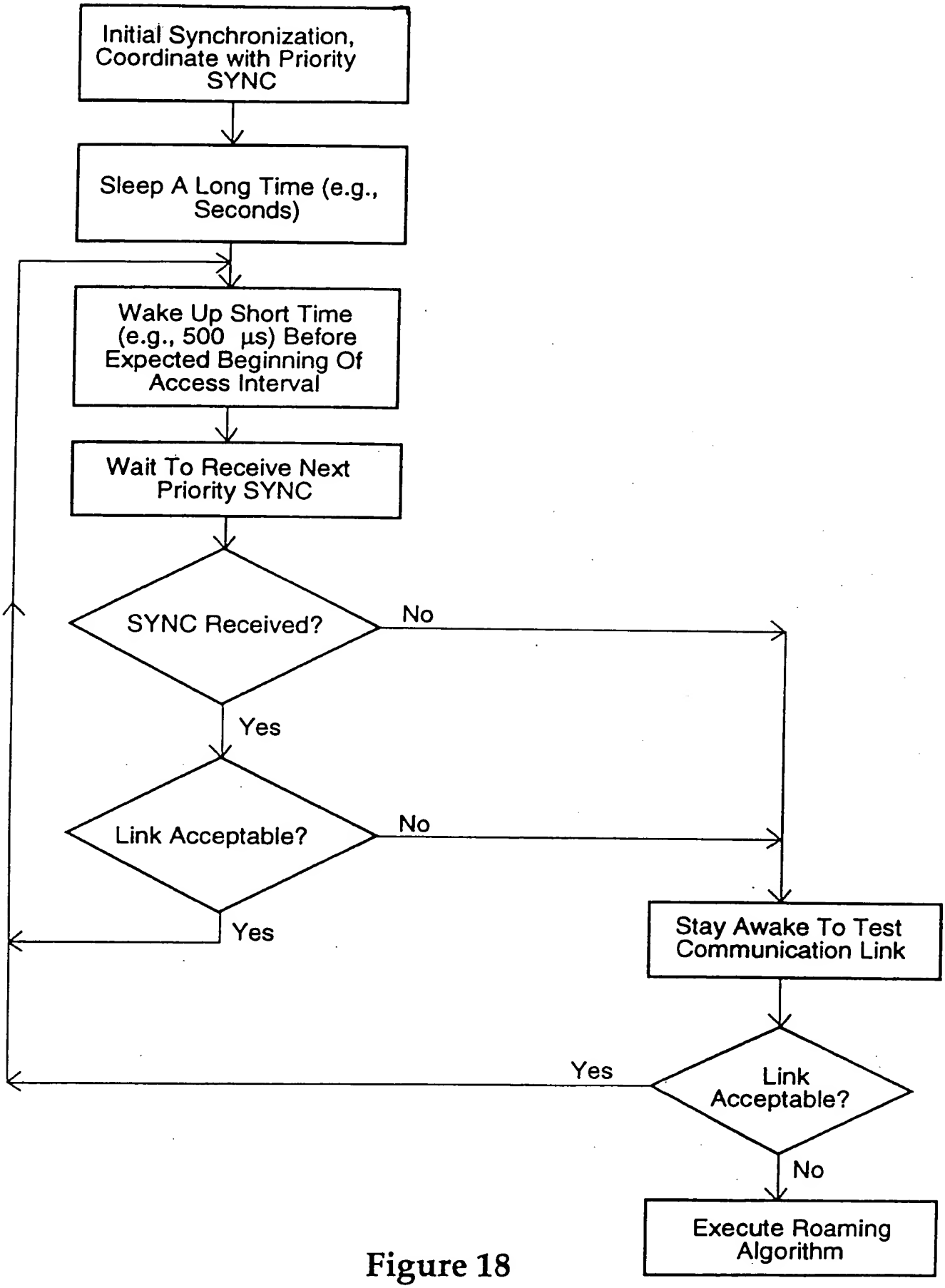

Initial Synchronization, Coordinate with Priority SYNC
Sleep A Long Time (e.g., Seconds)
Wake Up Short Time (e.g., 500 µs) Before Expected Beginning Of Access Interval
Wait To Receive Next Priority SYNC
SYNC Received?
No
Yes
Link Acceptable?
No
Yes
Stay Awake To Test Communication Link
Yes
Link Acceptable?
No
Execute Roaming Algorithm

Figure 18

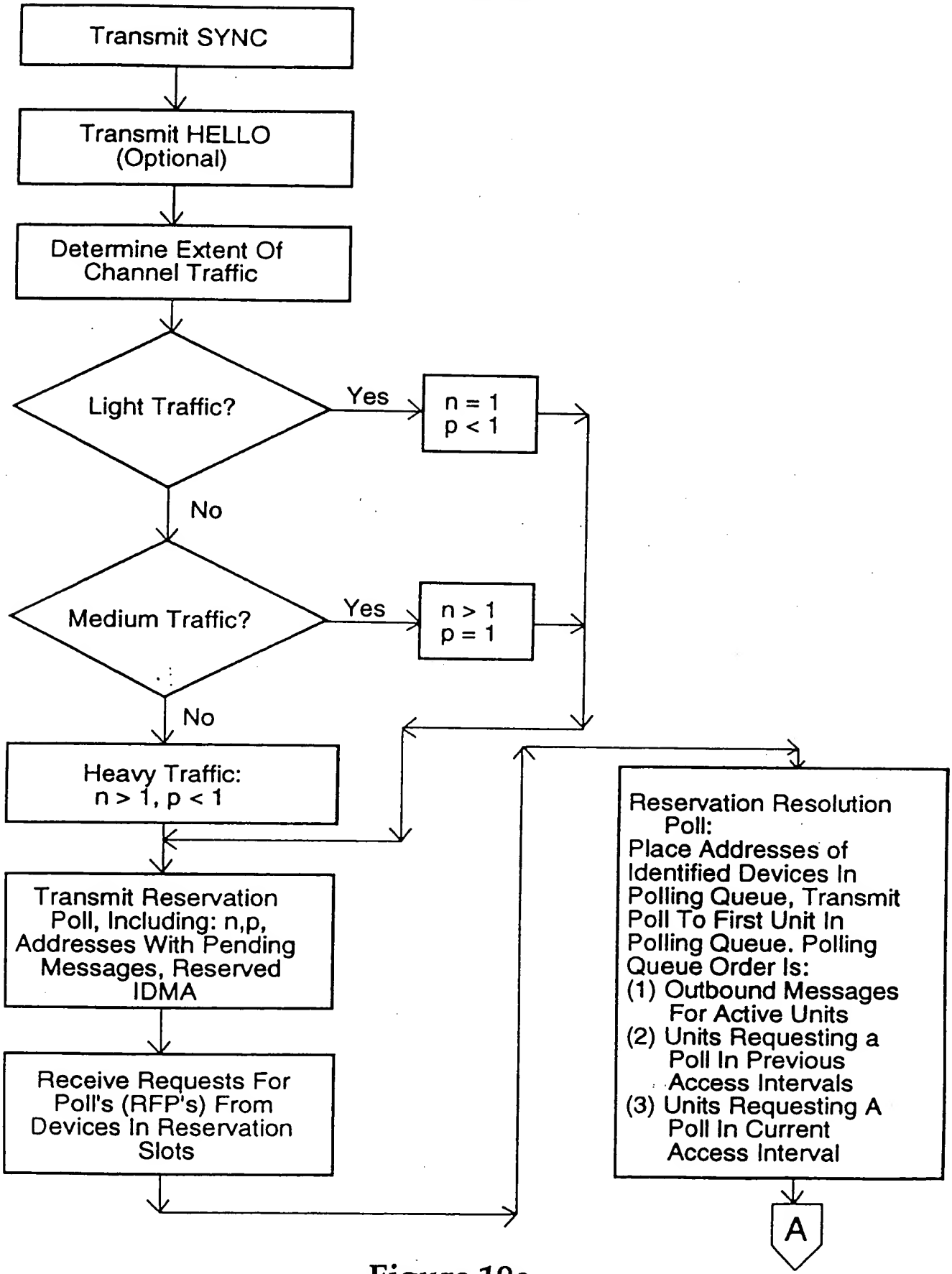


Figure 19a

WO 98/48539 PCT/US98/08048

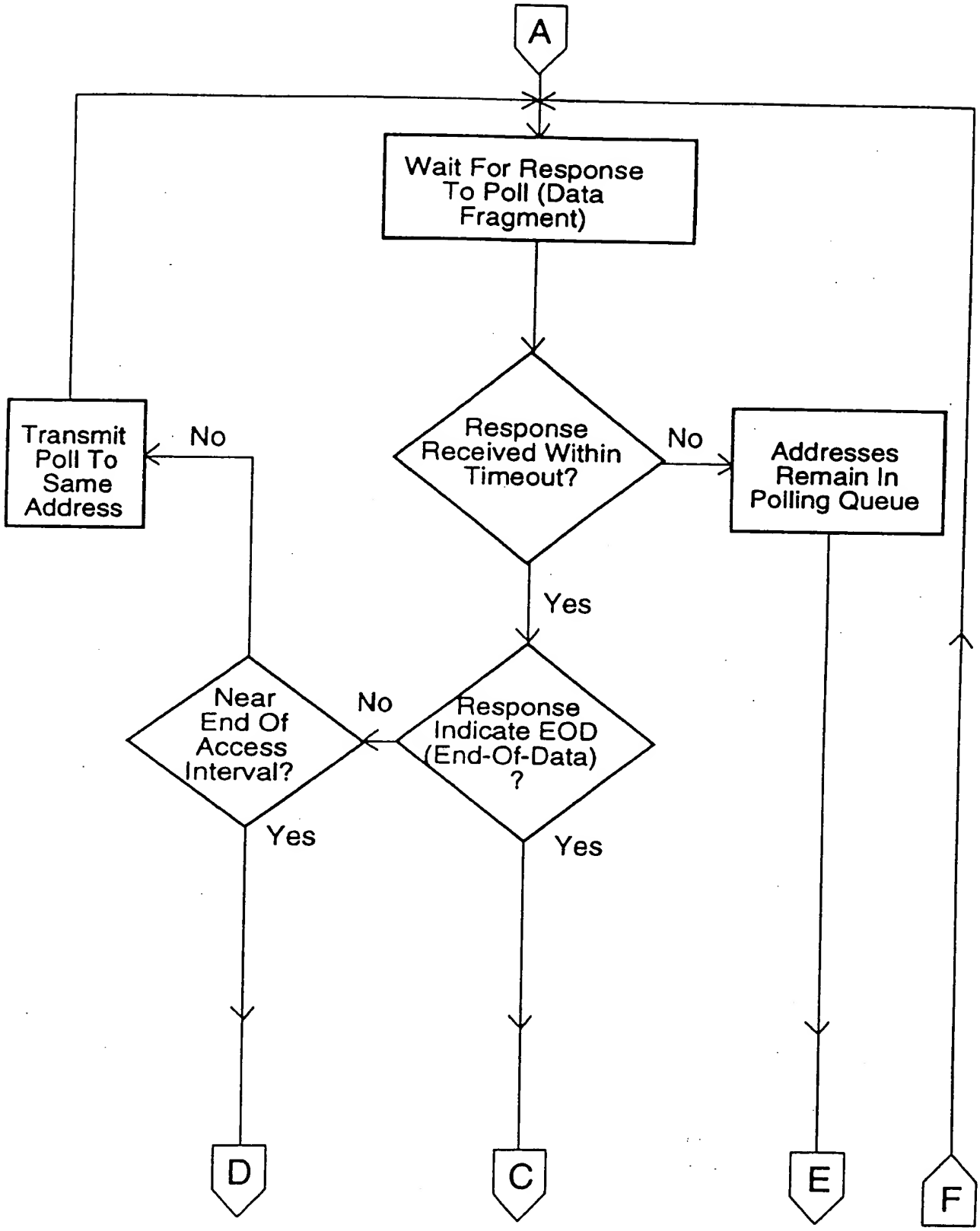

A
Wait For Response To Poll (Data Fragment)
Response Received Within Timeout?
No
Addresses Remain In Polling Queue
Yes
Response Indicate EOD (End-Of-Data) ?
No
Near End Of Access Interval?
No
Transmit Poll To Same Address
Yes
Yes
D
C
E
F

Figure 19b-1

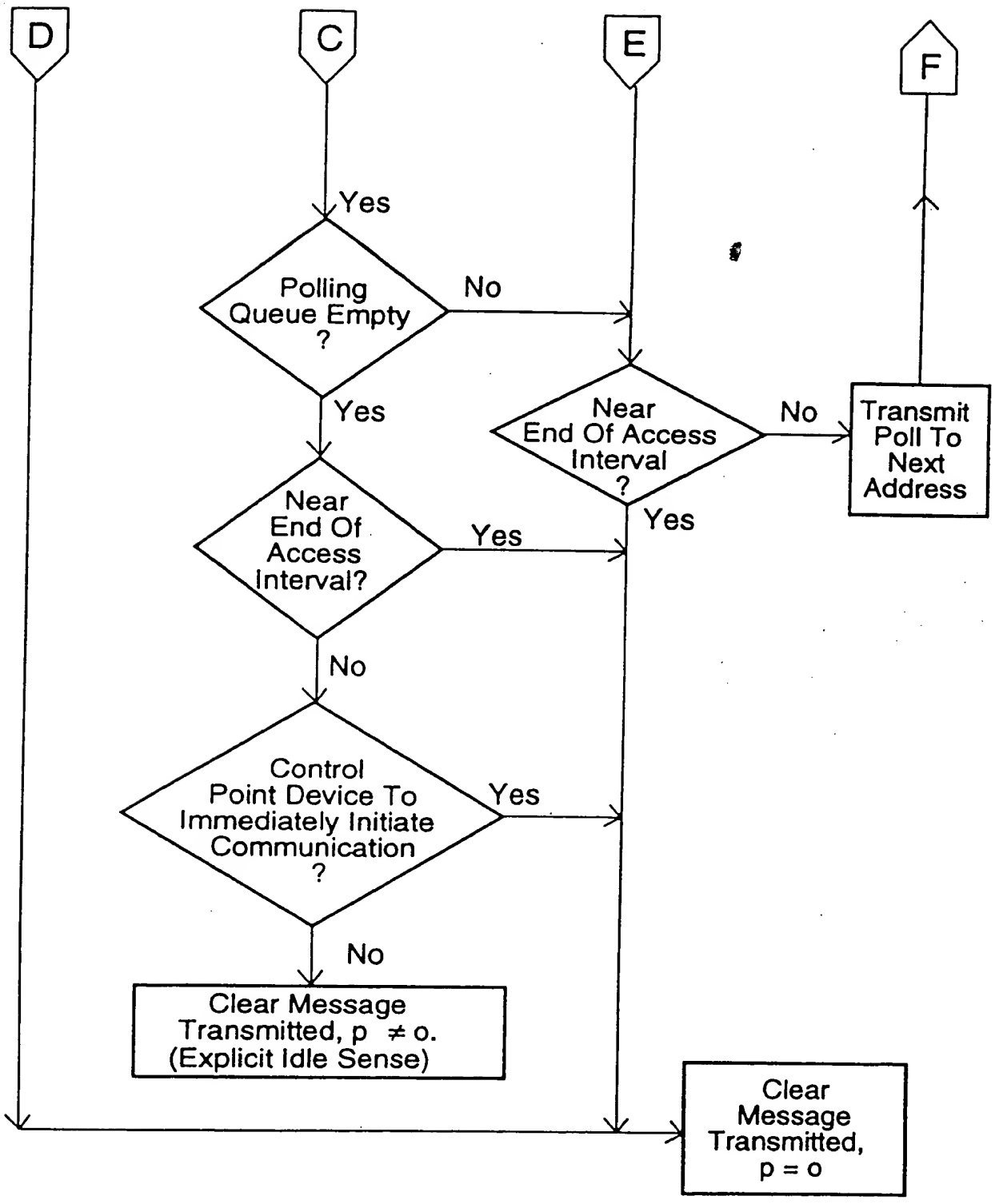

D
C
E
F
Yes
Polling Queue Empty ?
No
Yes
Near End Of Access Interval ?
No
Transmit Poll To Next Address
Yes
Near End Of Access Interval?
Yes
No
Control Point Device To Immediately Initiate Communication ?
Yes
No
Clear Message Transmitted, p ≠ o. (Explicit Idle Sense)
Clear Message Transmitted, p = o

Figure 19b-2

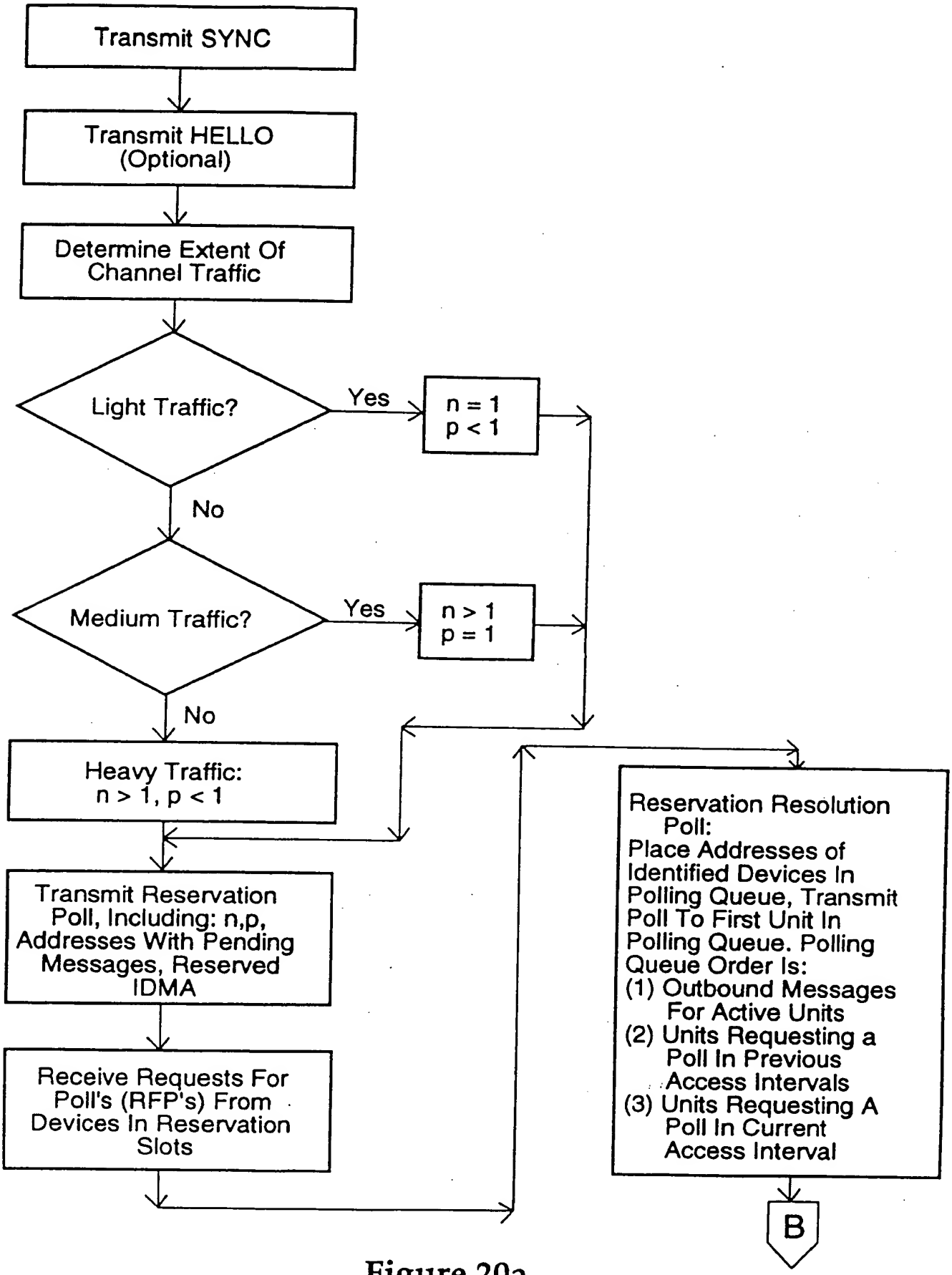

Transmit SYNC
Transmit HELLO (Optional)
Determine Extent Of Channel Traffic
Light Traffic?
Yes
n = 1
p < 1
No
Medium Traffic?
Yes
n > 1
p = 1
No
Heavy Traffic:
n > 1, p < 1
Transmit Reservation Poll, Including: n,p, Addresses With Pending Messages, Reserved IDMA
Receive Requests For Poll's (RFP's) From Devices In Reservation Slots
Reservation Resolution Poll:
Place Addresses of Identified Devices In Polling Queue, Transmit Poll To First Unit In Polling Queue. Polling Queue Order Is:
(1) Outbound Messages For Active Units
(2) Units Requesting a Poll In Previous Access Intervals
(3) Units Requesting A Poll In Current Access Interval
B

Figure 20a

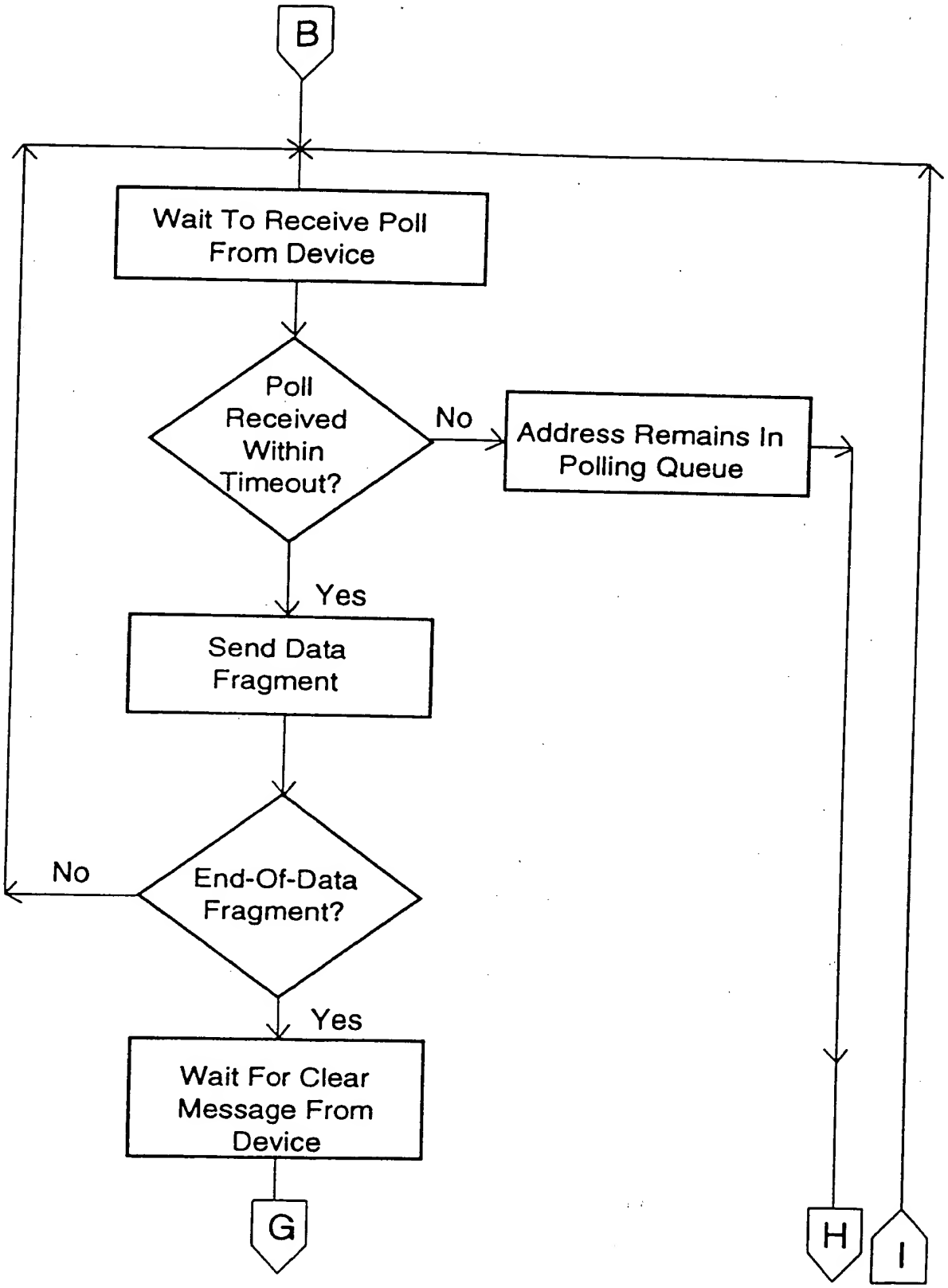

B
Wait To Receive Poll From Device
Poll Received Within Timeout?
No
Address Remains In Polling Queue
Yes
Send Data Fragment
End-Of-Data Fragment?
No
Yes
Wait For Clear Message From Device
G
H
I

Figure 20b-1

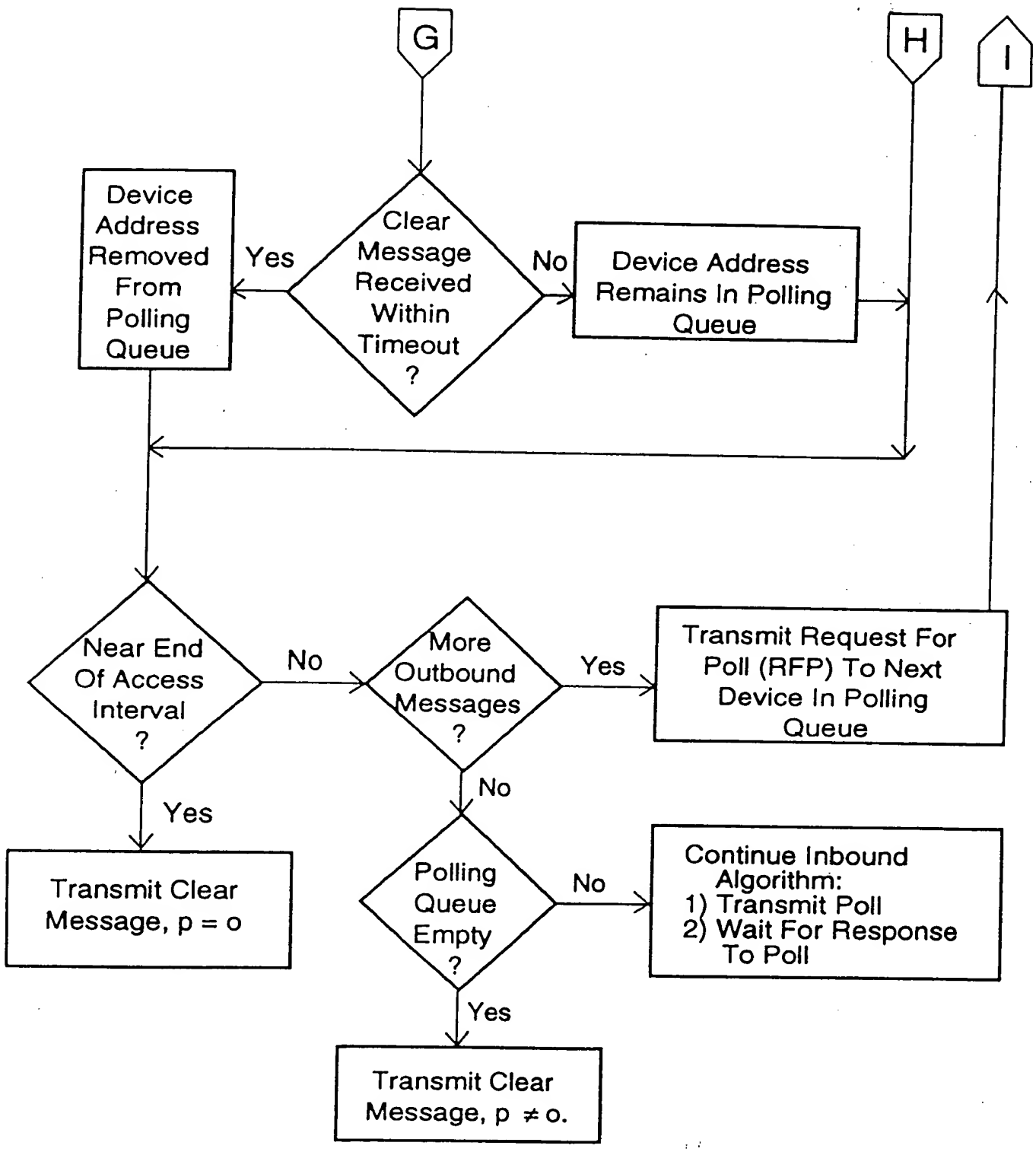

G
H
I
Device Address Removed From Polling Queue
Yes
Clear Message Received Within Timeout ?
No
Device Address Remains In Polling Queue
Near End Of Access Interval ?
No
More Outbound Messages ?
Yes
Transmit Request For Poll (RFP) To Next Device In Polling Queue
Yes
Transmit Clear Message, p = o
No
Polling Queue Empty ?
No
Continue Inbound Algorithm:
1) Transmit Poll
2) Wait For Response To Poll
Yes
Transmit Clear Message, p ≠ o.

Figure 20b-2

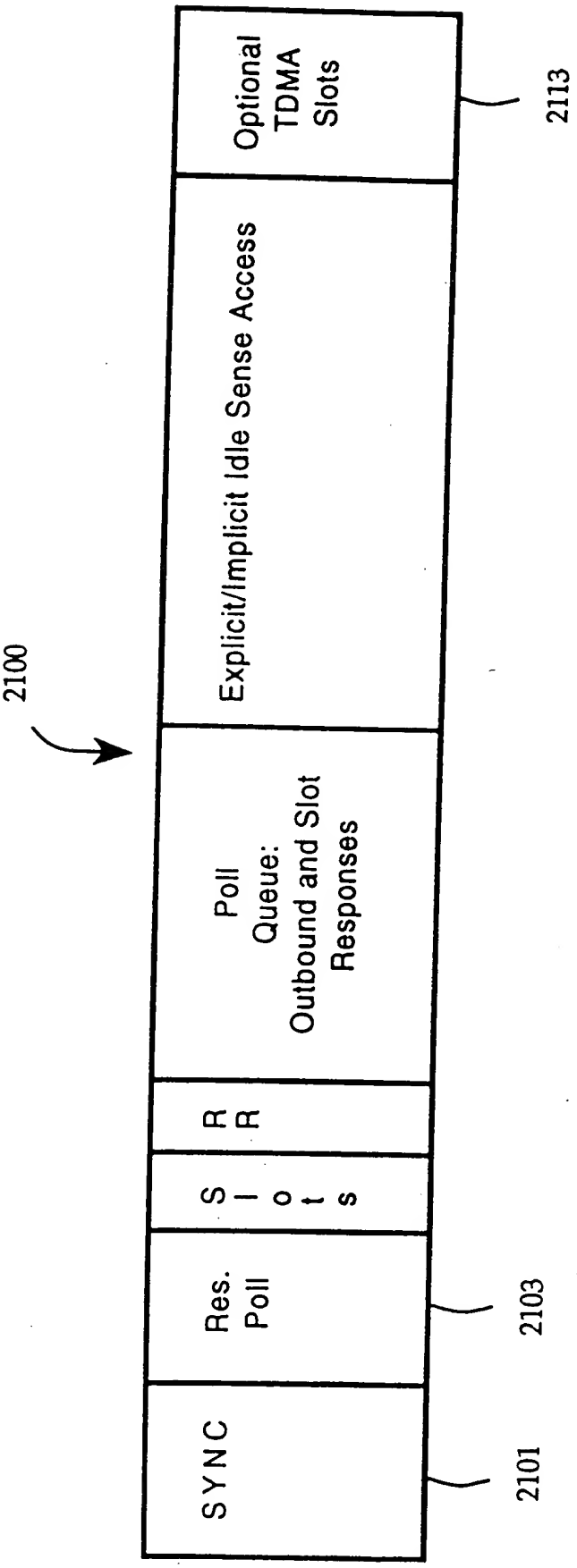

2100
SYNC
Res. Poll
S l o t s
R R
Poll Queue: Outbound and Slot Responses
Explicit/Implicit Idle Sense Access
Optional TDMA Slots
2101
2103
2113

Figure 21

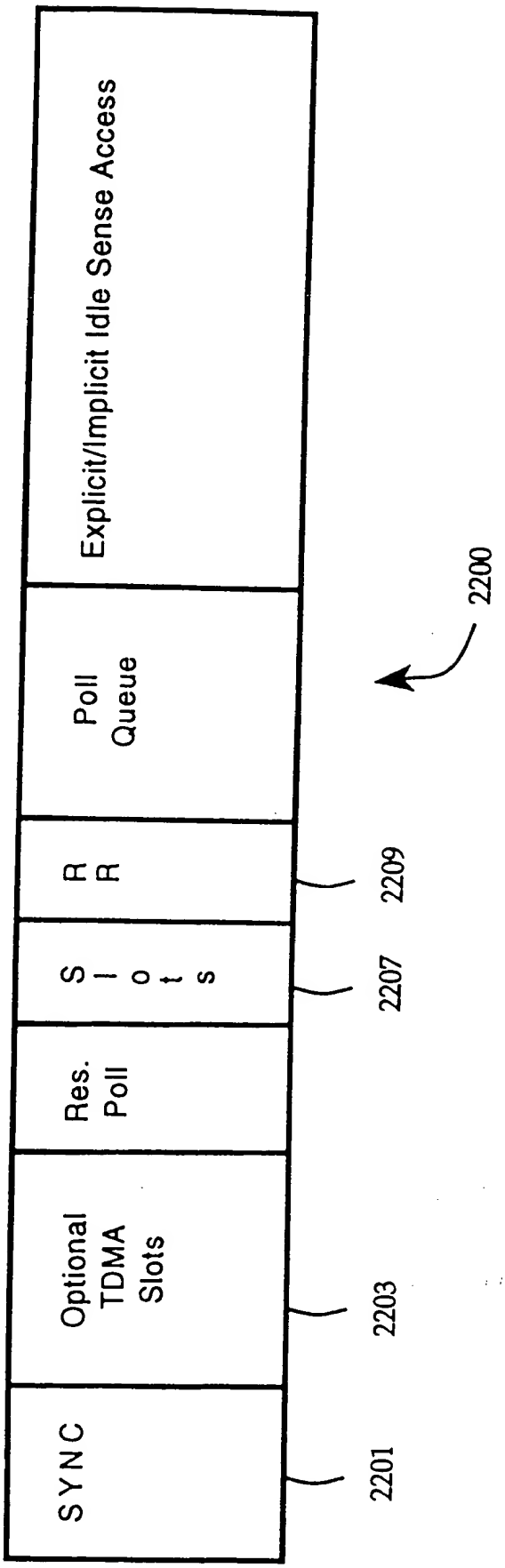

SYNC
Optional TDMA Slots
Res. Poll
S l o t s
R R
Poll Queue
Explicit/Implicit Idle Sense Access
2201
2203
2207
2209
2200

Figure 22

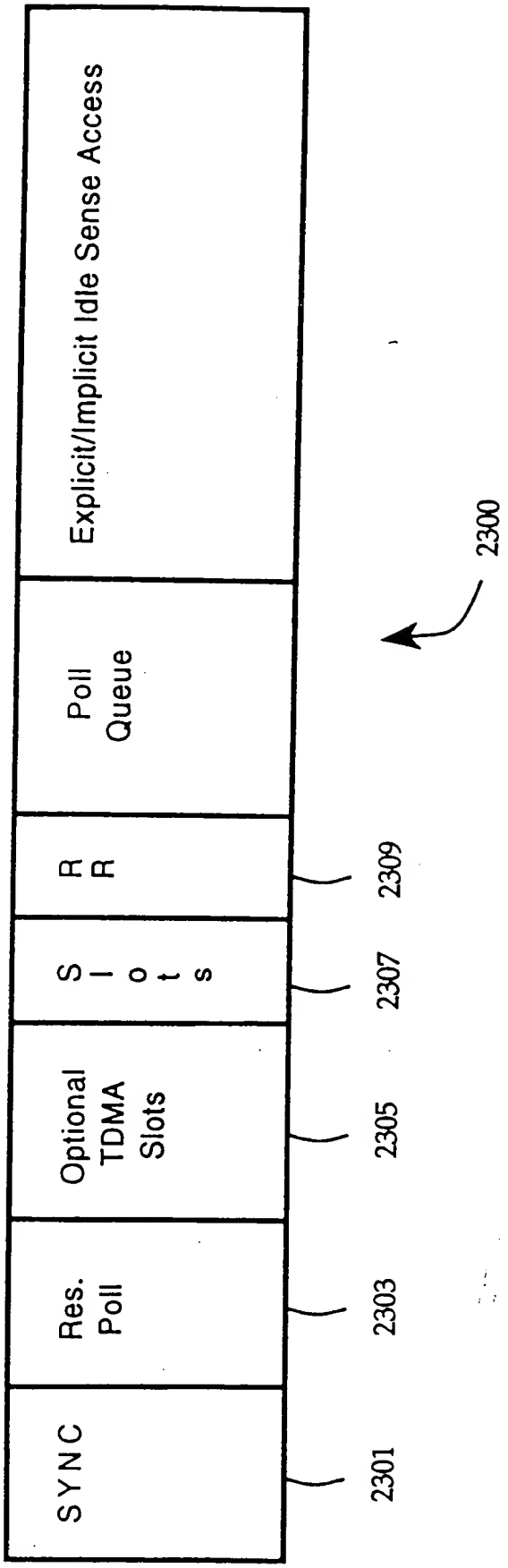

SYNC
Res. Poll
Optional TDMA Slots
S l o t s
R R
Poll Queue
Explicit/Implicit Idle Sense Access
2301
2303
2305
2307
2309
2300

Figure 23

86h080" 8hh62T60

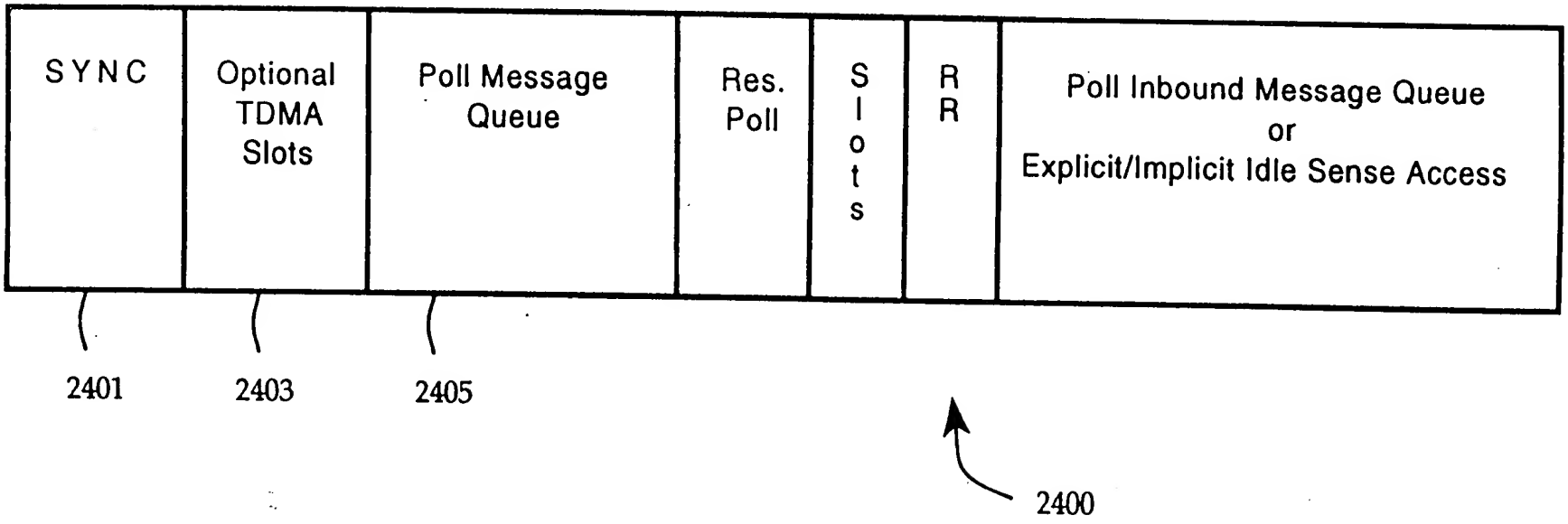
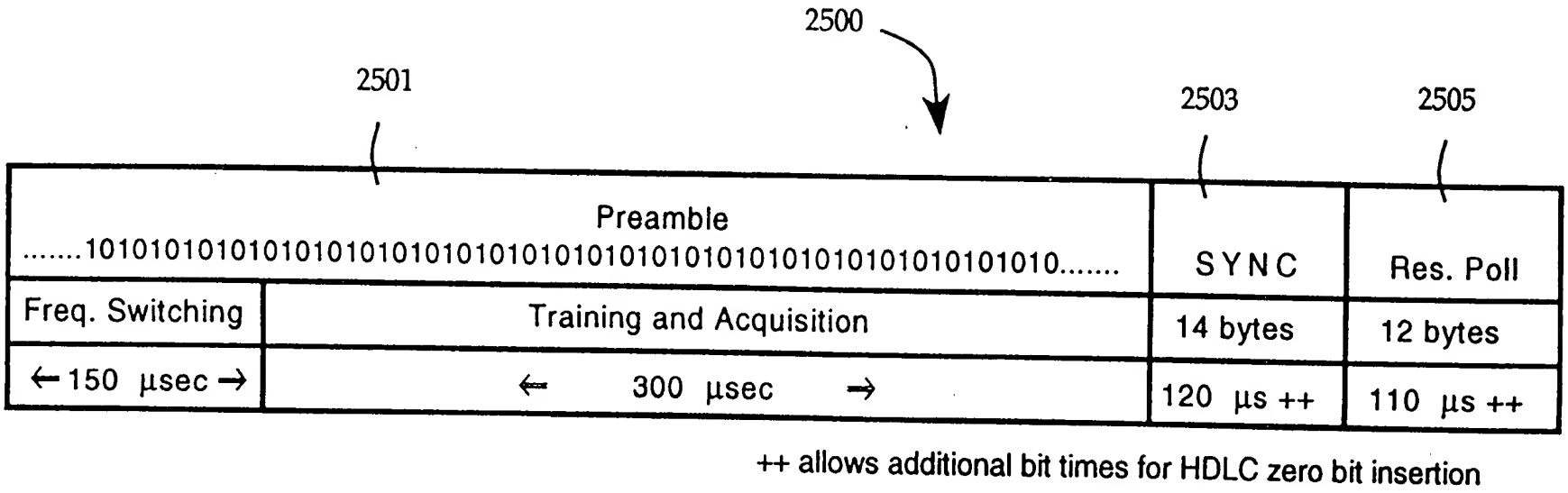


Figure 24

86h080" 8th62T60



++ allows additional bit times for HDLC zero bit insertion

Figure 25

SYNC

2600

Byte	Content	Definition
1	FLAG	Frame Delimiter
2	Dest. Address 1	Destination Address (SYNC = Broadcast = $FFFF_H$)
3	Dest. Address 2	Destination Address, 2nd Byte
4	TYPE	Message Type=SYNC, Priority Sync, or Priority SYNC with HELLO
5	Source Address 1	Control Point Address
6	Source Address 2	Control Point Address, 2nd Byte
7*	SYSTEM ID	System Identifier (LAN ID)
8*	NET ID	Net ID
9*	Command/Status 1	Control Point Status
		2 Bits Control Point Type
		2 Bits Loading Factor
		1 Bit Scheduled Service Availability
		3 Bits Reserved
10*	Command/Status 2	Scheduled Services
		5 Bits Number of Allocated TDMA Time Slots
		3 Bits Number of Available Time Slots
11*	Random	Randomly Selected Character for Improved Encryption
12	CRC 1	Error Check
13	CRC 2	Error Check
14	FLAG	Frame Delimiter

Figure 26

*Optionally Encrypted Bytes

86h080" 8hh62T60

Reservation Poll

2700

Byte	Content	Definition
1	FLAG	Frame Delimiter
2	Dest. Address 1	Destination Address (RES = Broadcast = $FFFF_H$)
3	Dest. Address 2	Destination Address, 2nd Byte
4	TYPE	Message Type = RES POLL
5	SLOT PARMS	3 Bits Number of Slots
6		5 Bits Probability Factor
7*	Sequence	Hopping Sequence ID
8*	Index	Hopping Sequence Index
9*	NET PARMS	
		3 Bits Hop Rate
		2 Bits Al's per Hop
		3 Bits Reserved
10	CRC 1	Error Check
11	CRC 2	Error Check
12	FLAG	Frame Delimiter

Figure 27

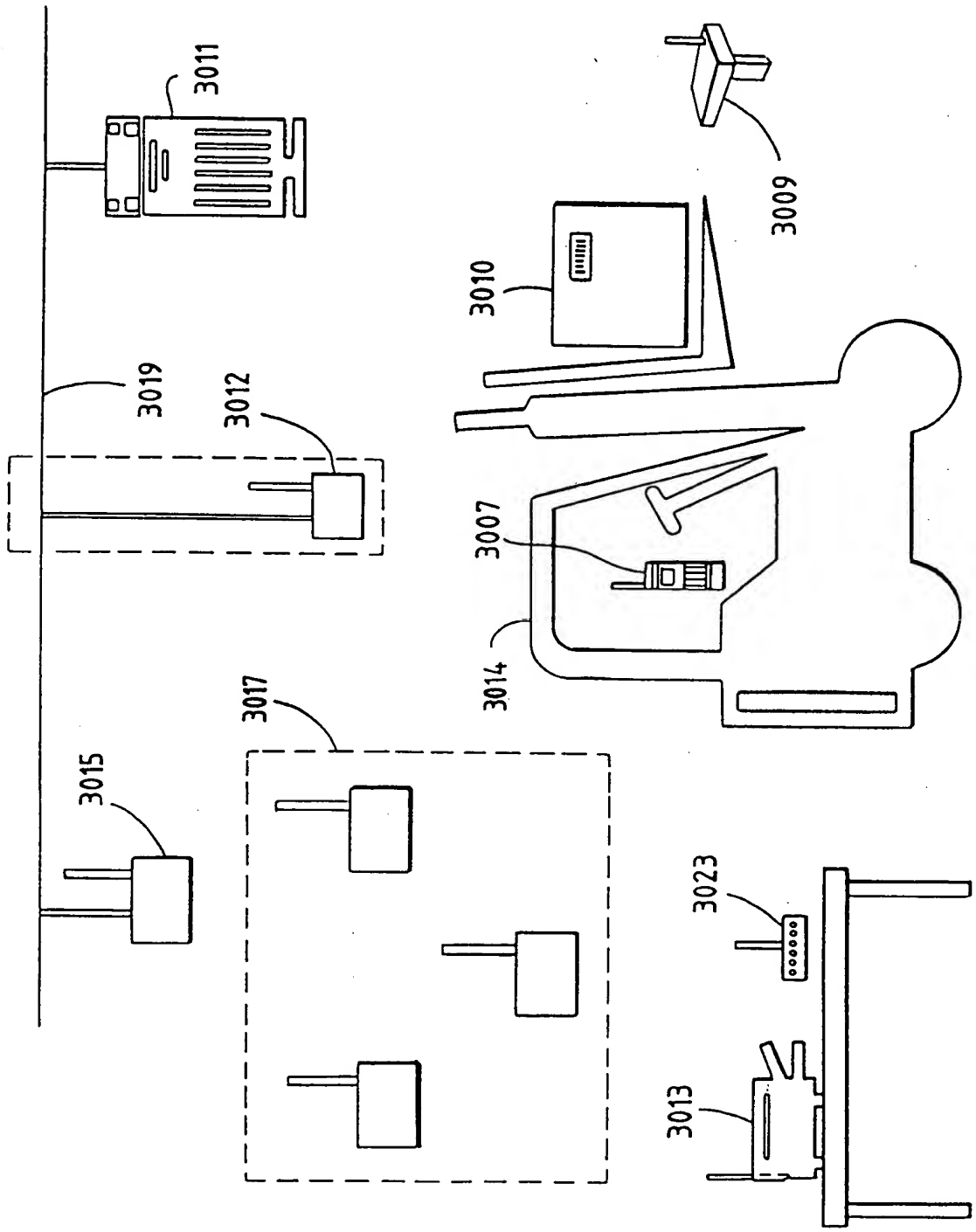


Fig. 28A

WO 2004/084460 PCT/EP2004/002980

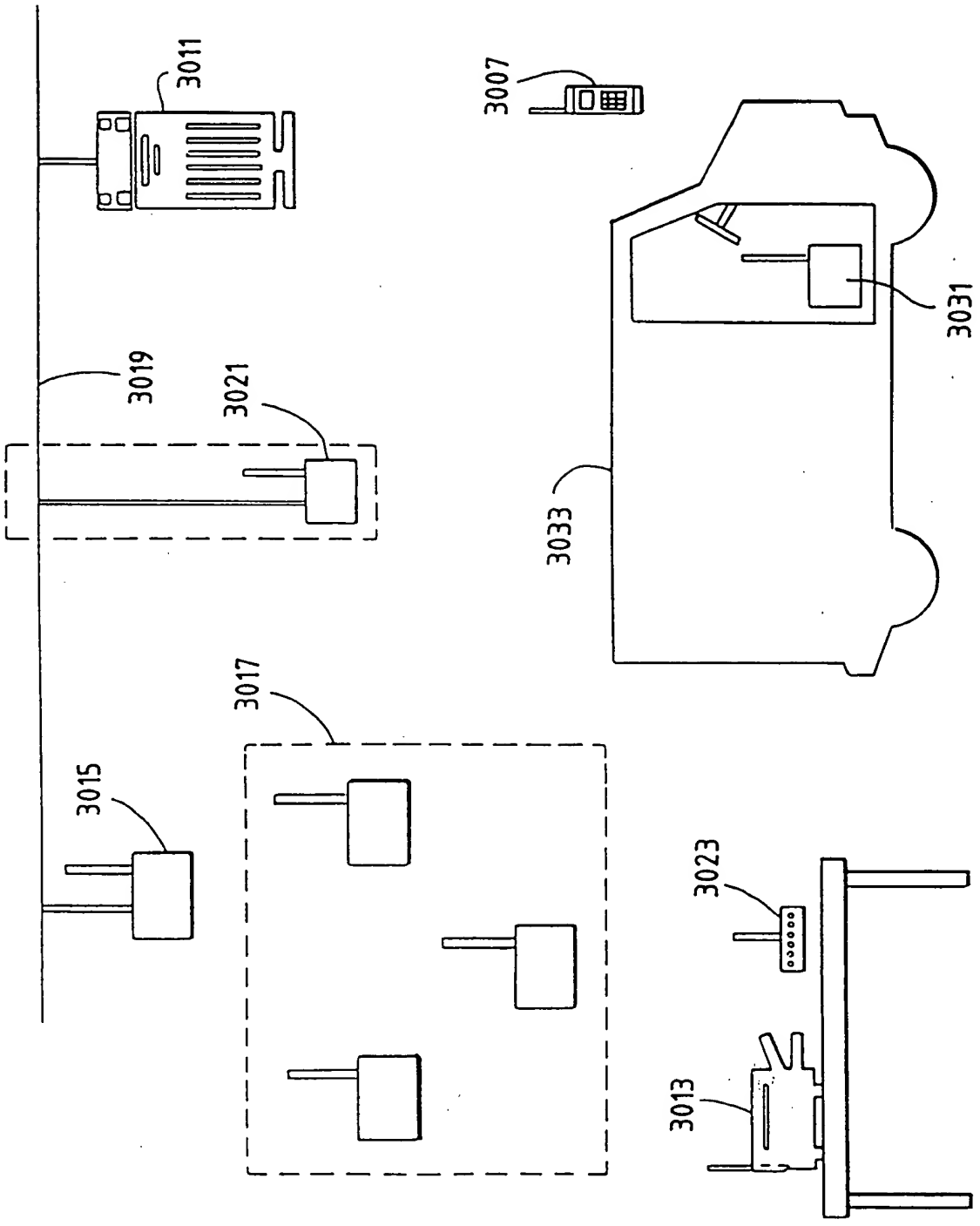


Fig. 28b

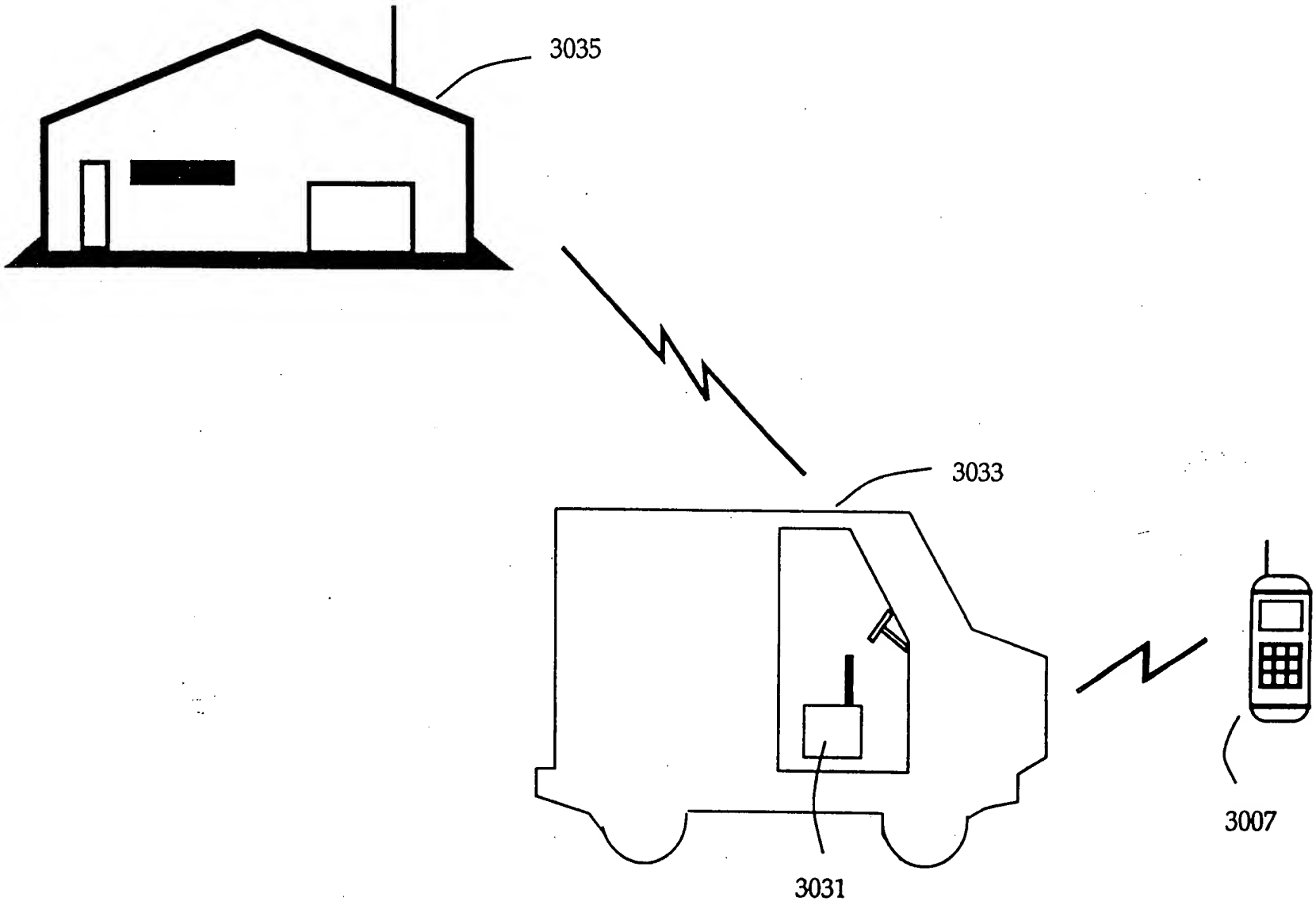


Figure 28C

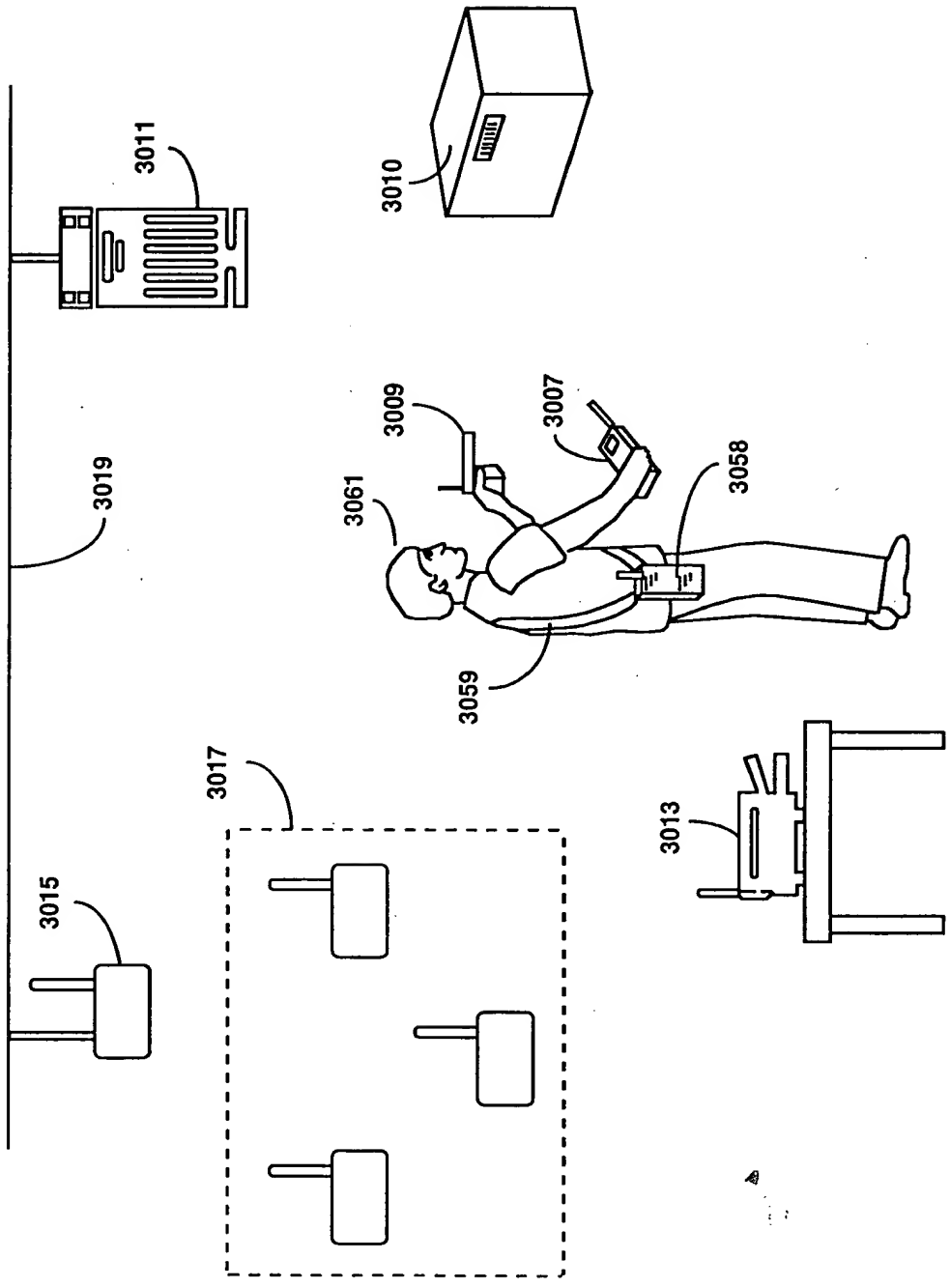


Fig. 29a

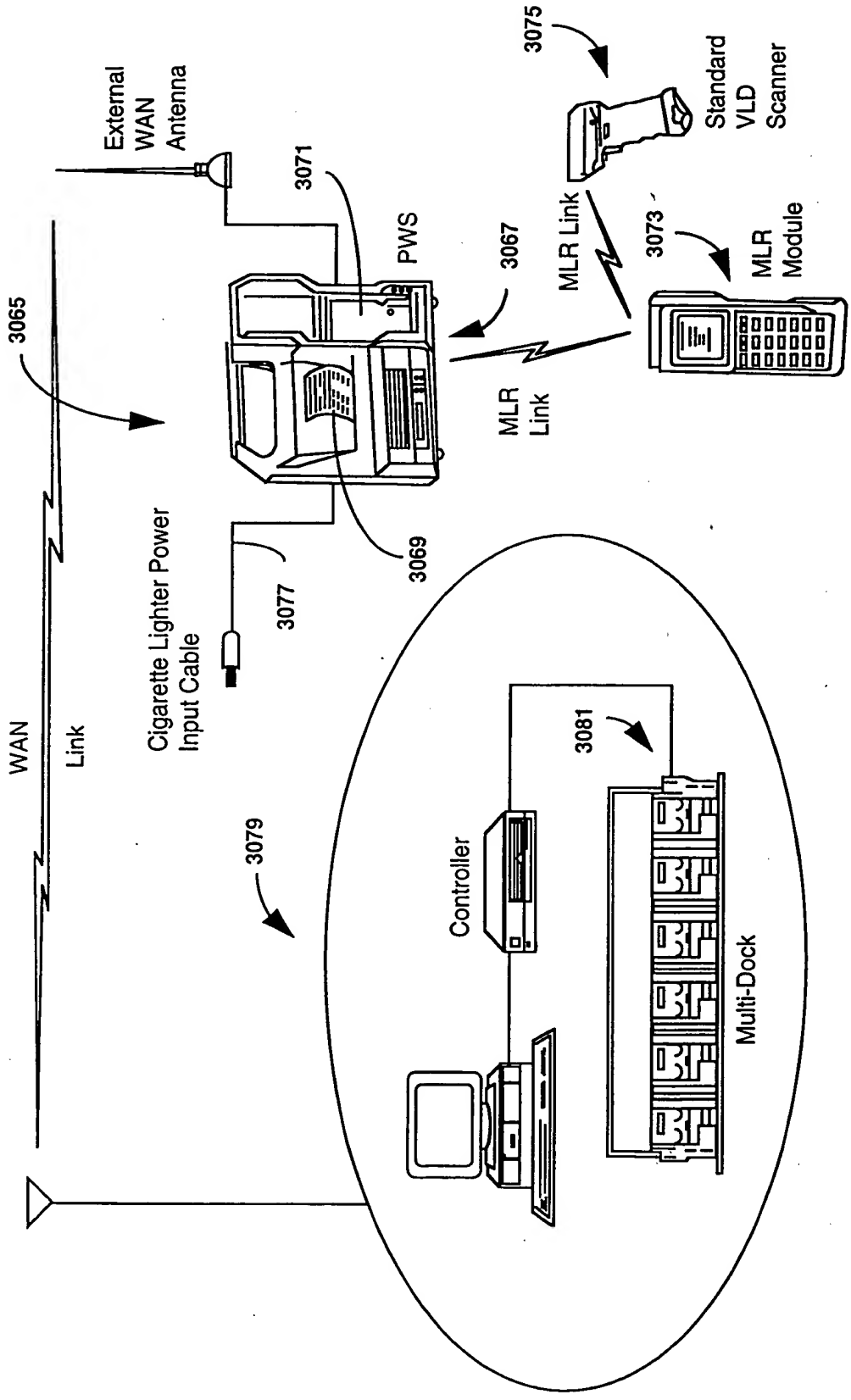

External WAN Antenna
3071
PWS
3067
3075
Standard VLD Scanner
MLR Link
3073
MLR Module
MLR Link
3065
WAN Link
Cigarette Lighter Power Input Cable
3077
3069
3079
Controller
3081
Multi-Dock

Fig. 29b

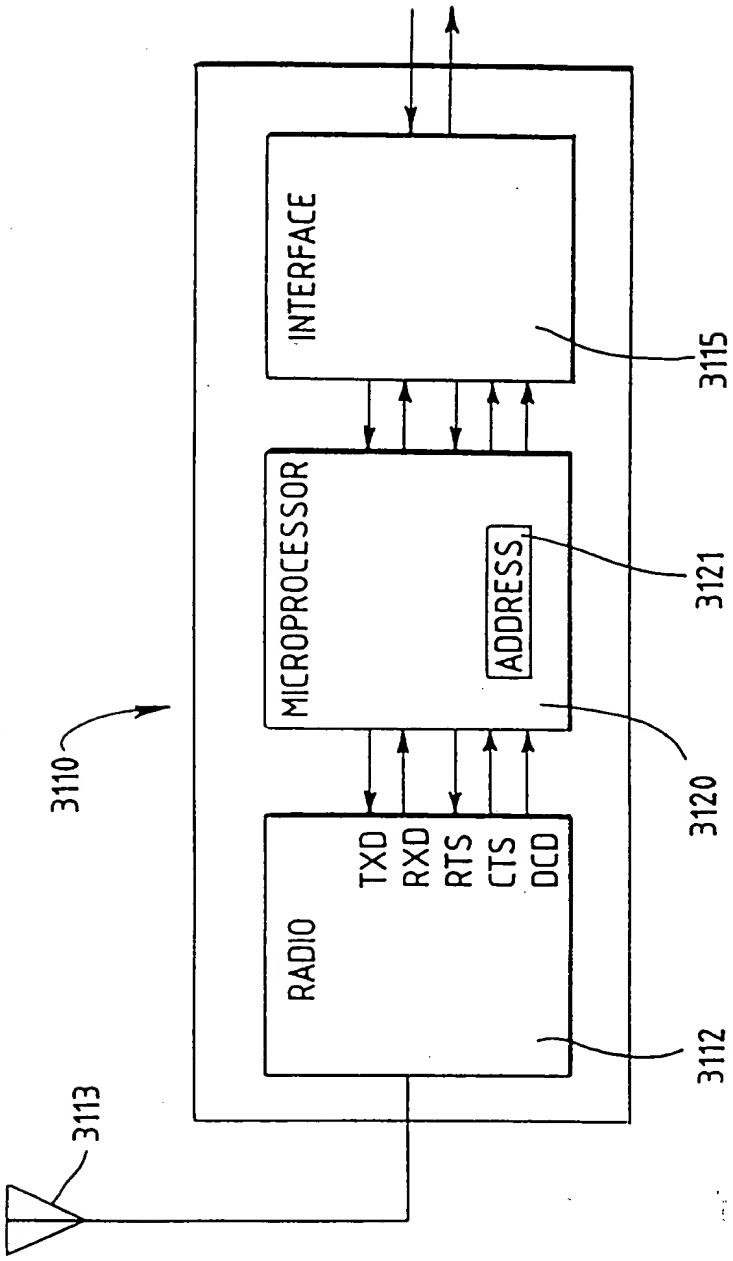

INTERFACE
3115
MICROPROCESSOR
ADDRESS
3121
3120
3110
TXD
RXD
RTS
CTS
DCD
RADIO
3112
3113

Fig. 30

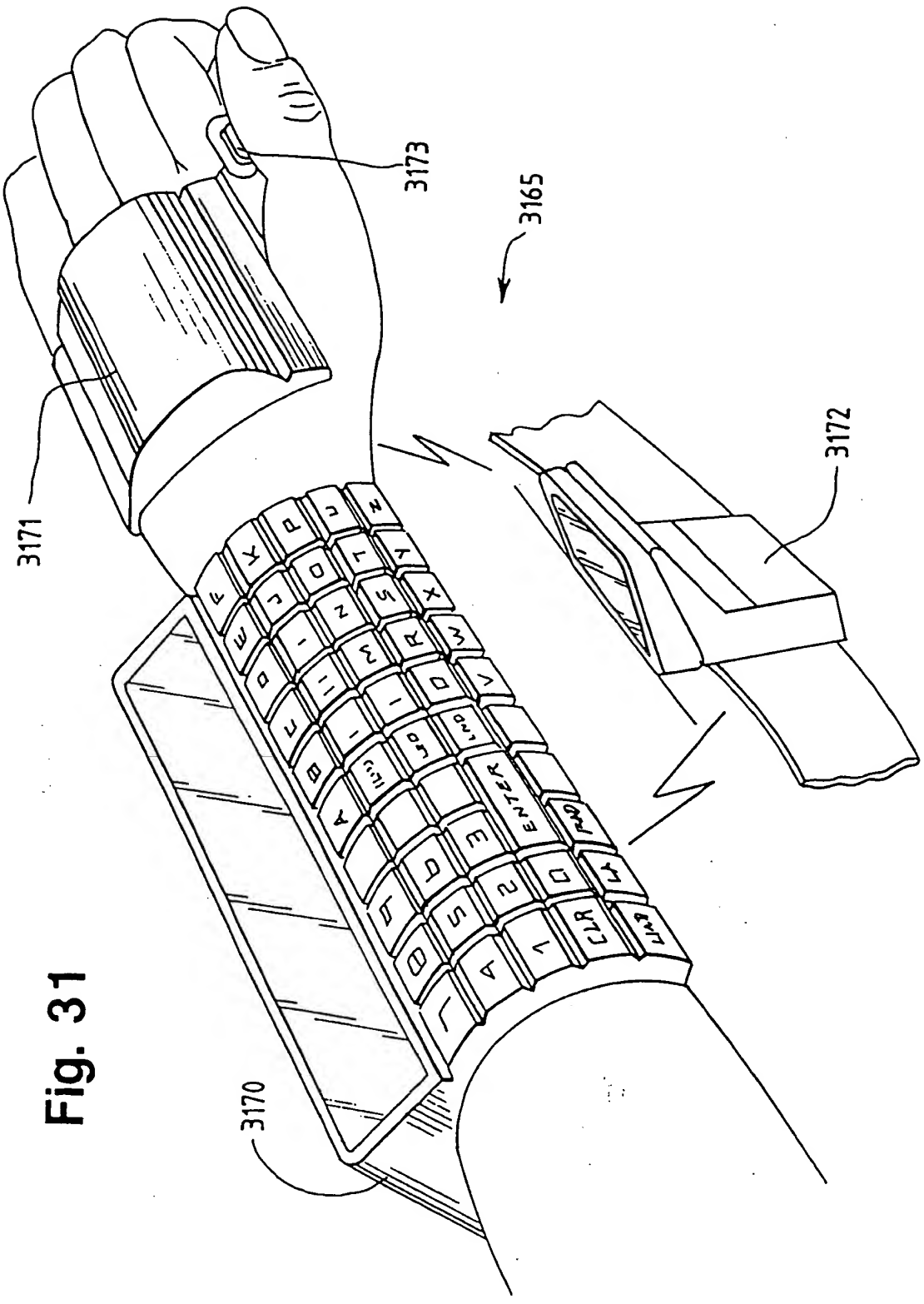
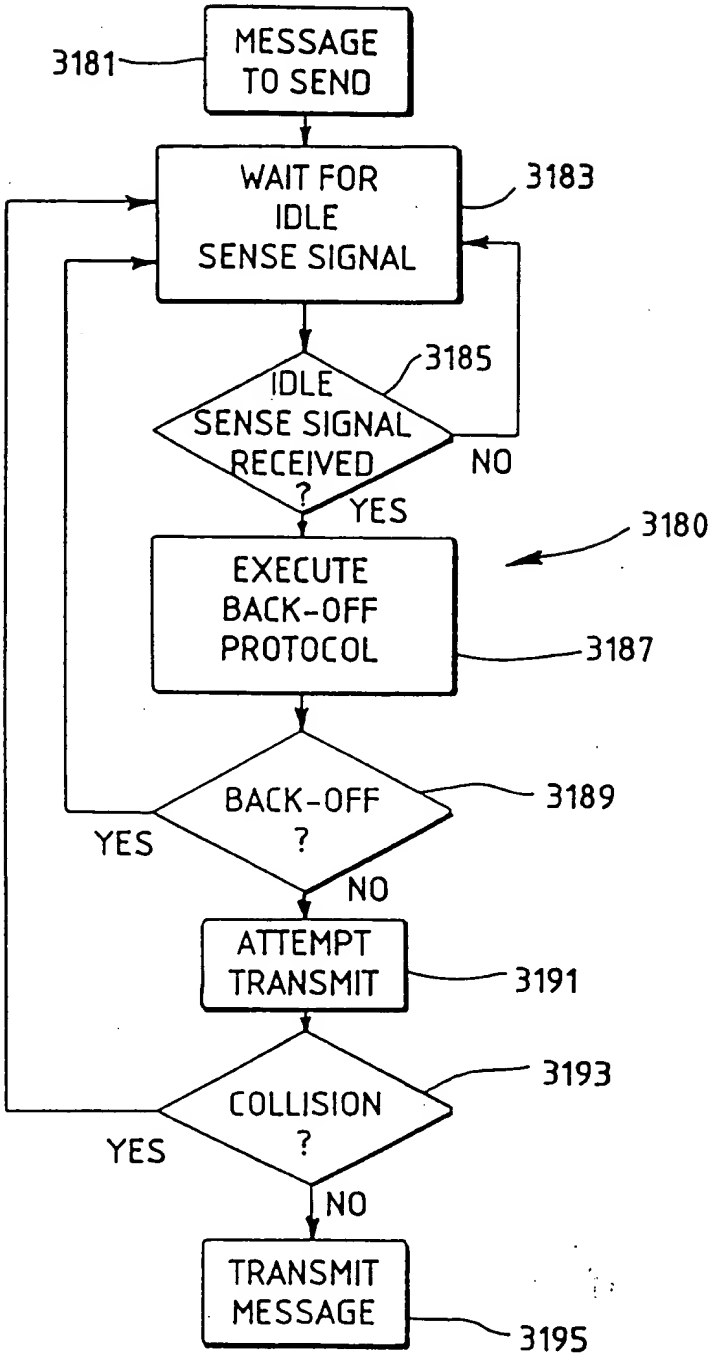


Fig. 31

Fig. 32


3181
MESSAGE TO SEND
WAIT FOR IDLE SENSE SIGNAL
3183
IDLE SENSE SIGNAL RECEIVED ?
3185
NO
YES
3180
EXECUTE BACK-OFF PROTOCOL
3187
BACK-OFF ?
3189
YES
NO
ATTEMPT TRANSMIT
3191
COLLISION ?
3193
YES
NO
TRANSMIT MESSAGE
3195

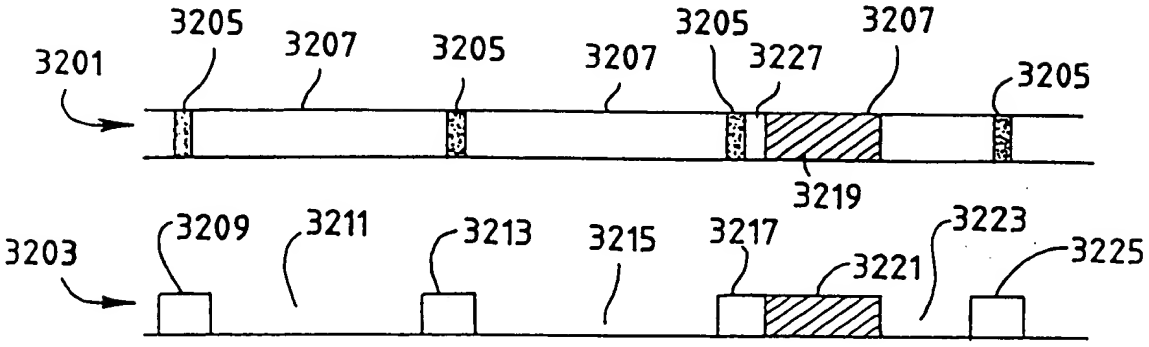


Fig. 33a

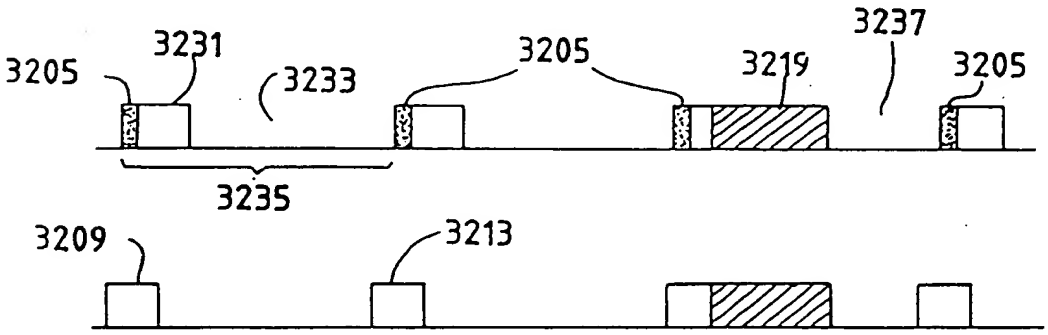


Fig. 33b

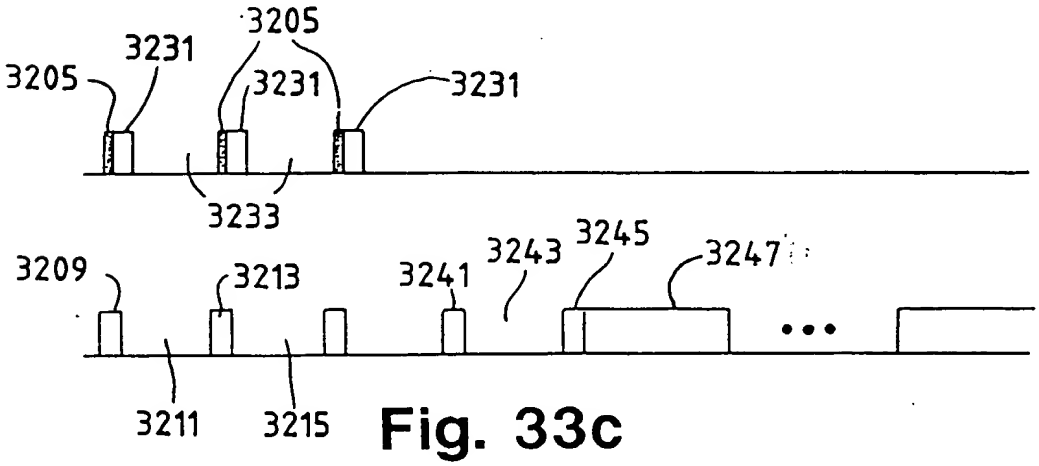


Fig. 33c

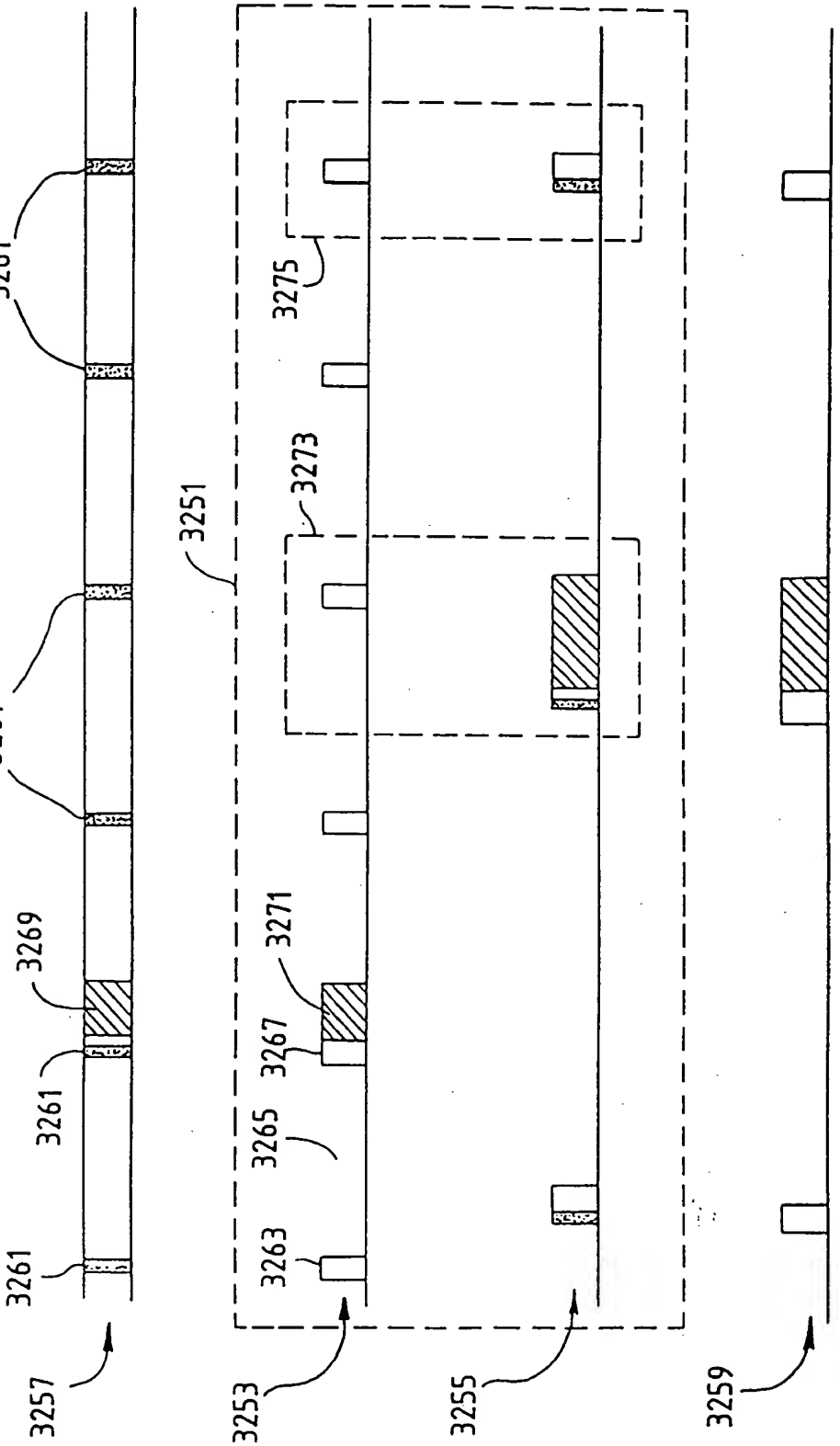

3261
3261
3261
3269
3261
3257
3251
3273
3275
3271
3267
3265
3263
3253
3255
3259

Fig. 34

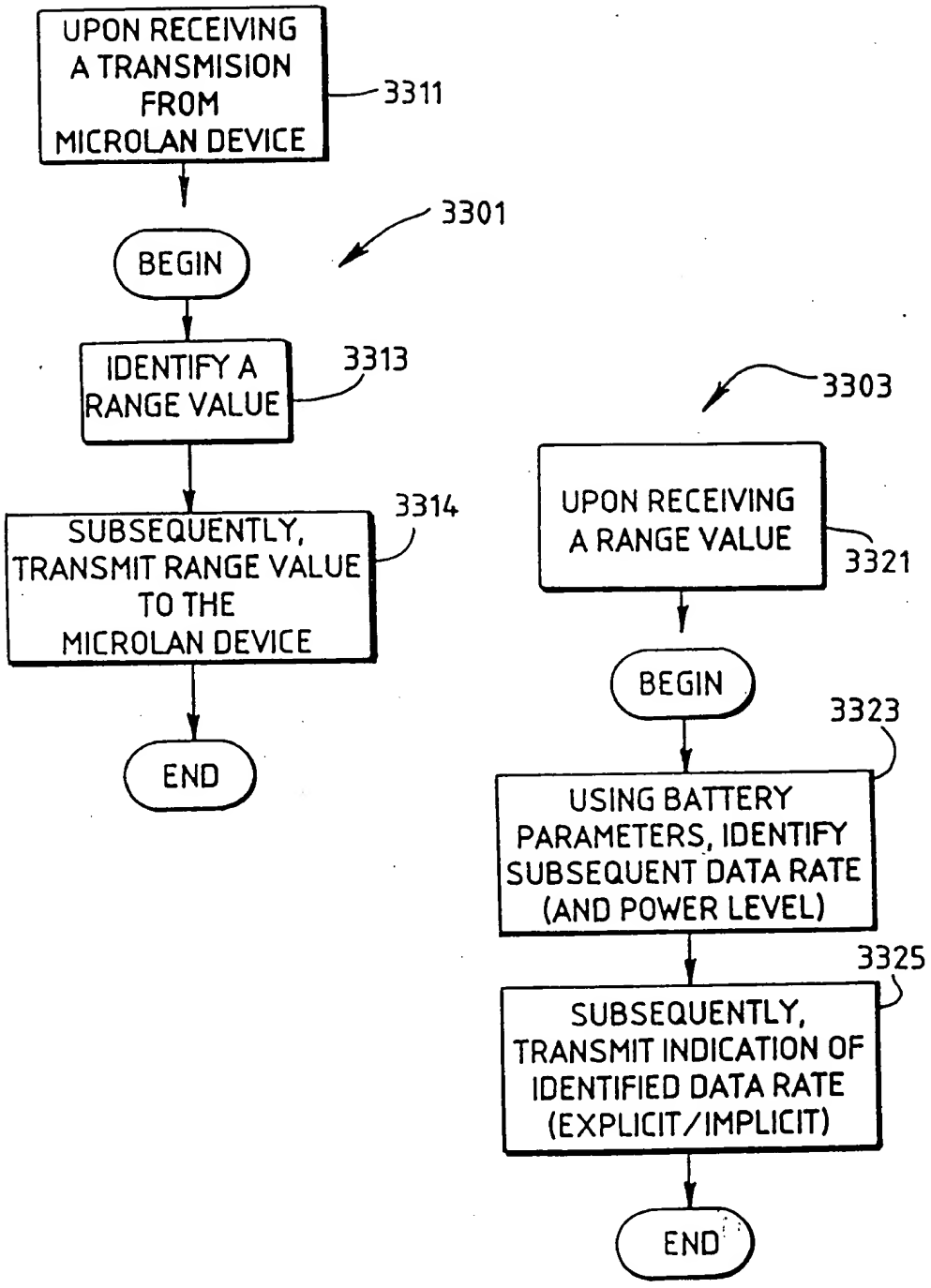
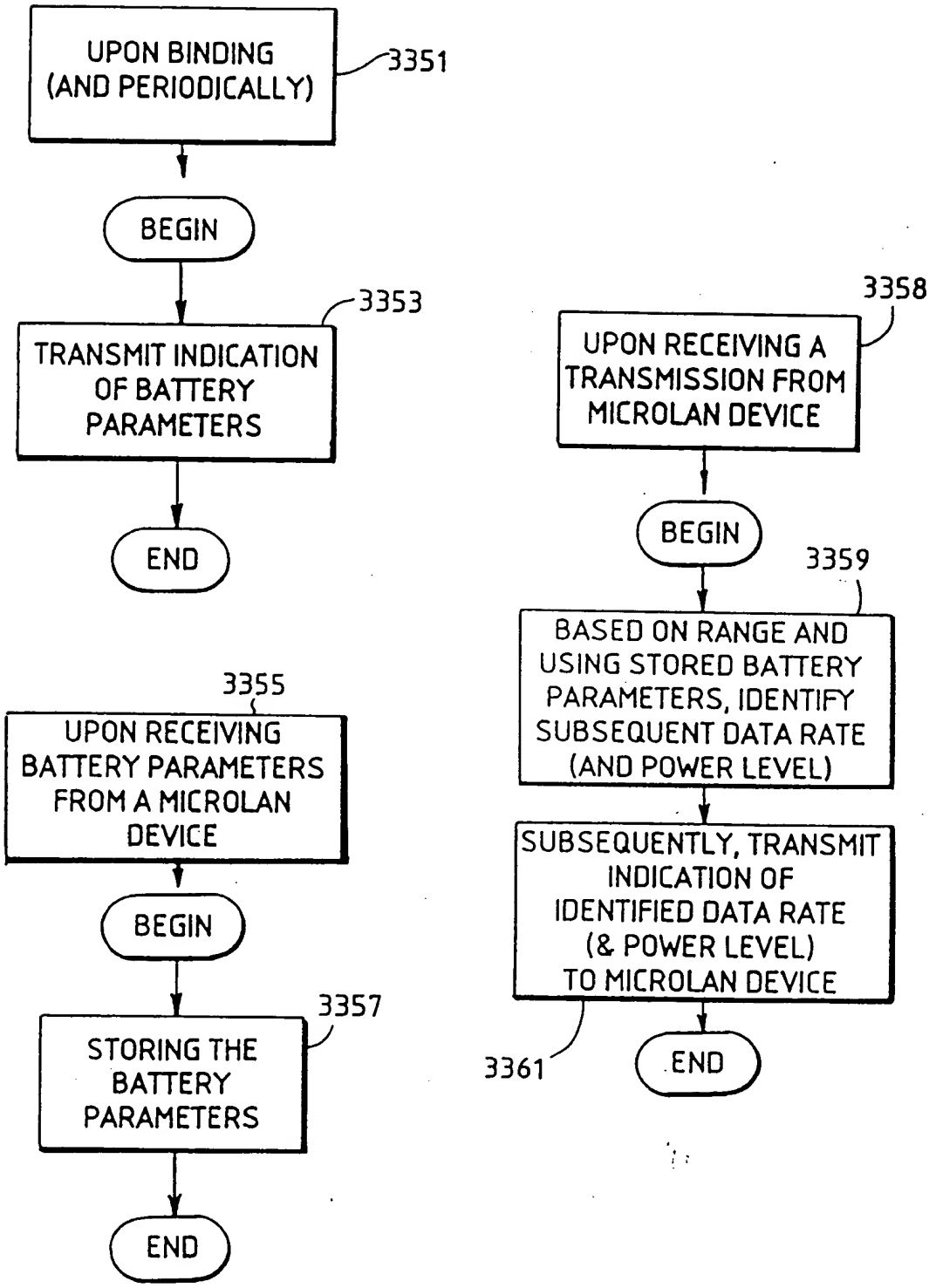

UPON RECEIVING A TRANSMISION FROM MICROLAN DEVICE
3311
3301
BEGIN
IDENTIFY A RANGE VALUE
3313
SUBSEQUENTLY, TRANSMIT RANGE VALUE TO THE MICROLAN DEVICE
3314
END
3303
UPON RECEIVING A RANGE VALUE
3321
BEGIN
3323
USING BATTERY PARAMETERS, IDENTIFY SUBSEQUENT DATA RATE (AND POWER LEVEL)
3325
SUBSEQUENTLY, TRANSMIT INDICATION OF IDENTIFIED DATA RATE (EXPLICIT/IMPLICIT)
END

Fig. 35

Fig. 36


UPON BINDING (AND PERIODICALLY)
3351
BEGIN
TRANSMIT INDICATION OF BATTERY PARAMETERS
3353
END
UPON RECEIVING BATTERY PARAMETERS FROM A MICROLAN DEVICE
3355
BEGIN
STORING THE BATTERY PARAMETERS
3357
END
UPON RECEIVING A TRANSMISSION FROM MICROLAN DEVICE
3358
BEGIN
BASED ON RANGE AND USING STORED BATTERY PARAMETERS, IDENTIFY SUBSEQUENT DATA RATE (AND POWER LEVEL)
3359
SUBSEQUENTLY, TRANSMIT INDICATION OF IDENTIFIED DATA RATE (& POWER LEVEL) TO MICROLAN DEVICE
3361
END

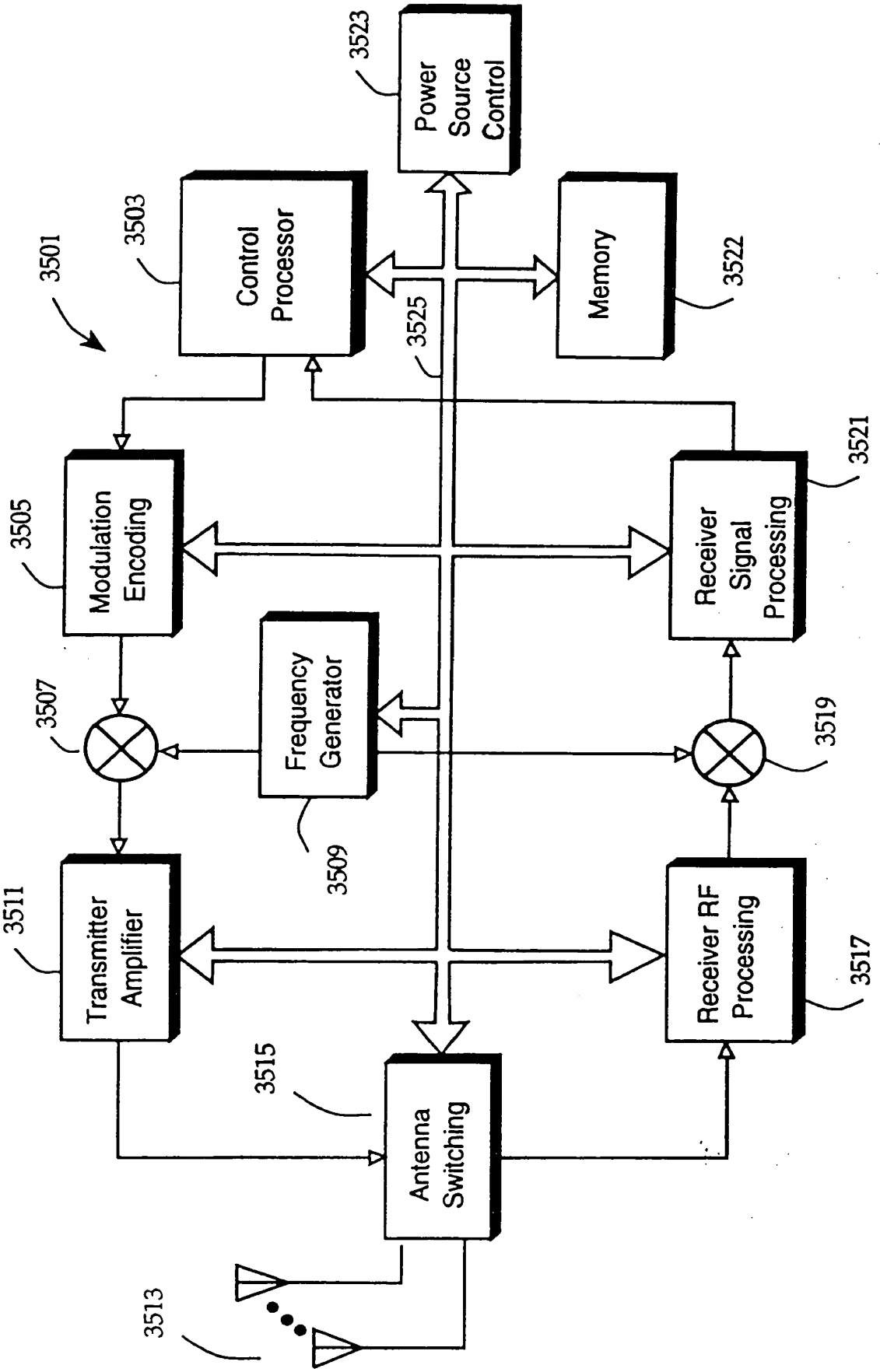

3501
3503
Control Processor
3523
Power Source Control
3525
Memory
3522
3505
Modulation Encoding
3521
Receiver Signal Processing
3507
Frequency Generator
3519
3509
3511
Transmitter Amplifier
Receiver RF Processing
3517
3515
Antenna Switching
3513

Figure 37

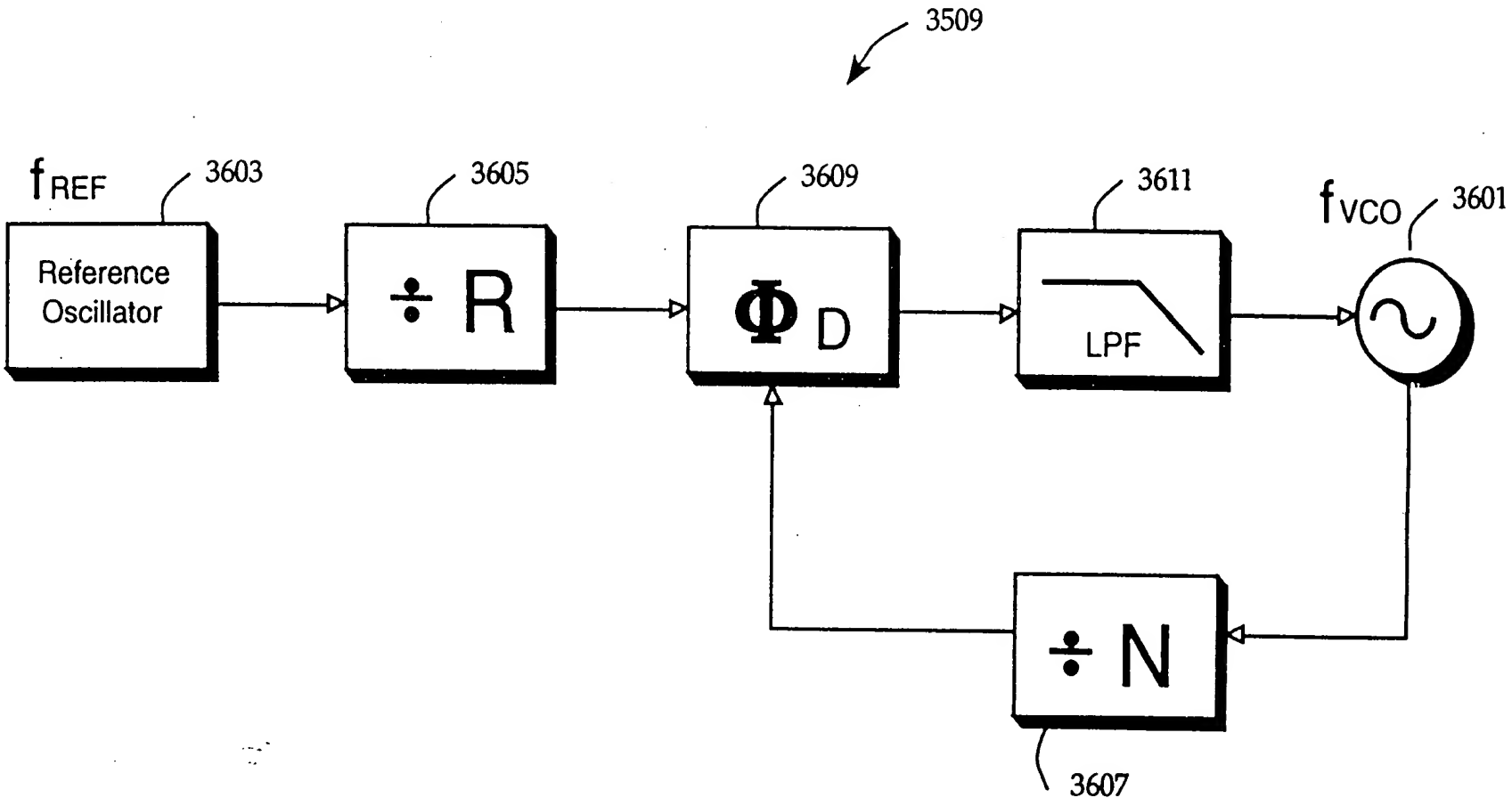

3509
fREF
3603
Reference Oscillator
3605
÷ R
3609
Φ D
3611
LPF
fVCO
3601
÷ N
3607

Figure 38

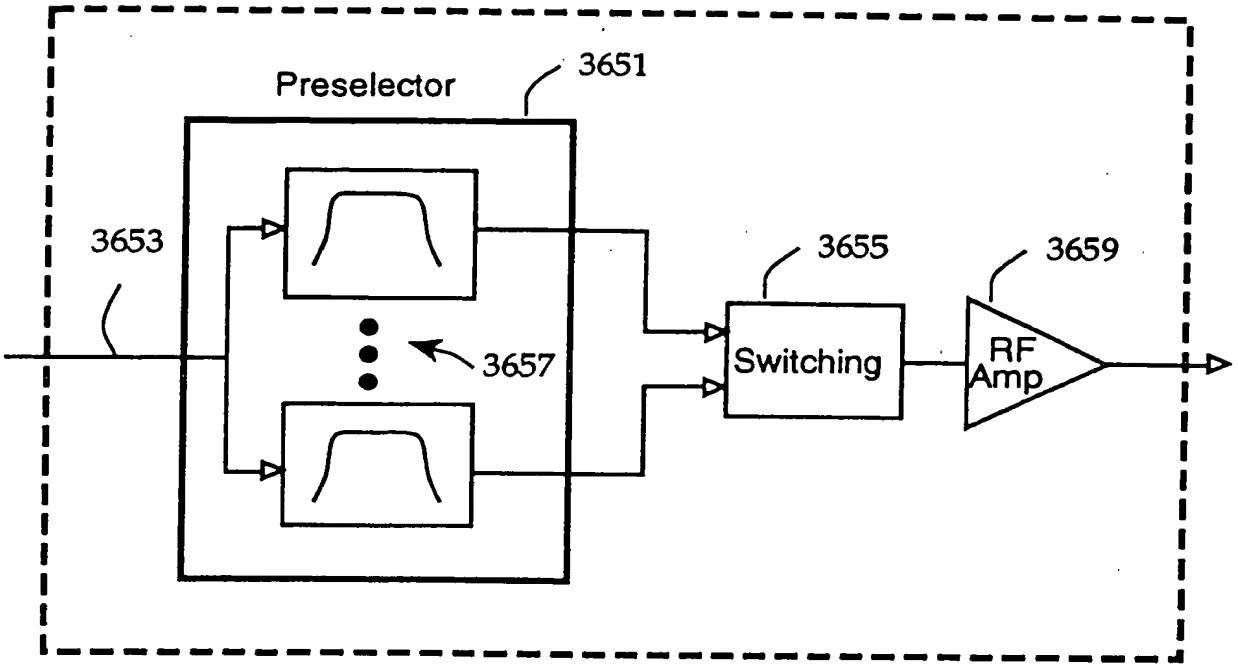


Figure 39

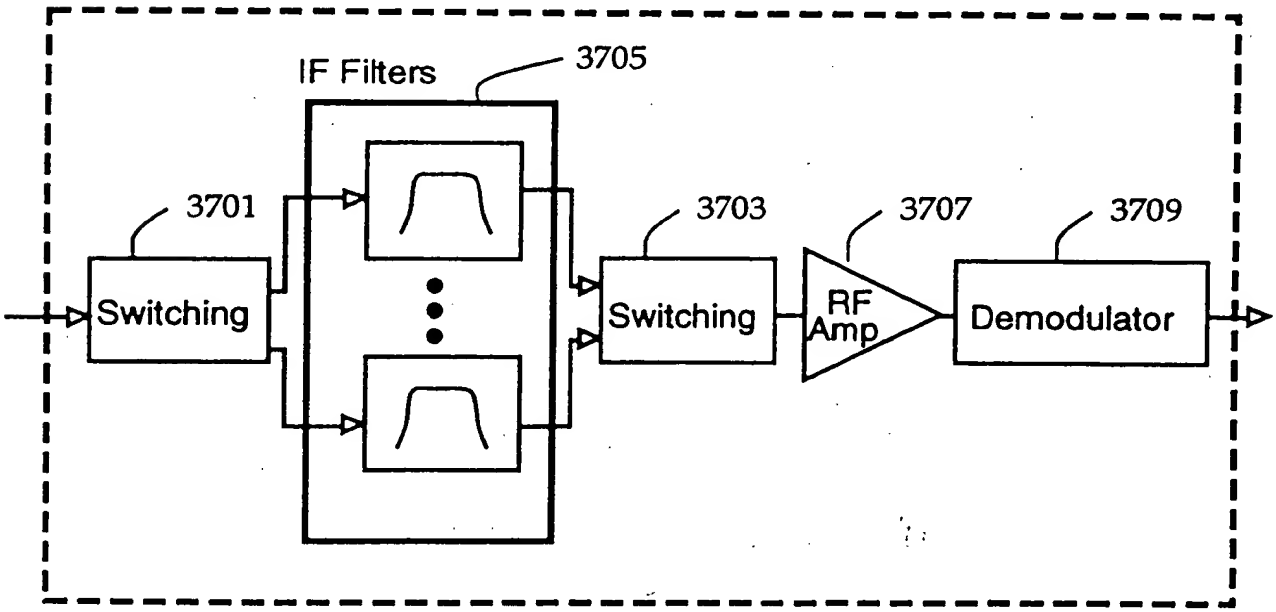


Figure 40

09/890,468 PCT/US00/02146

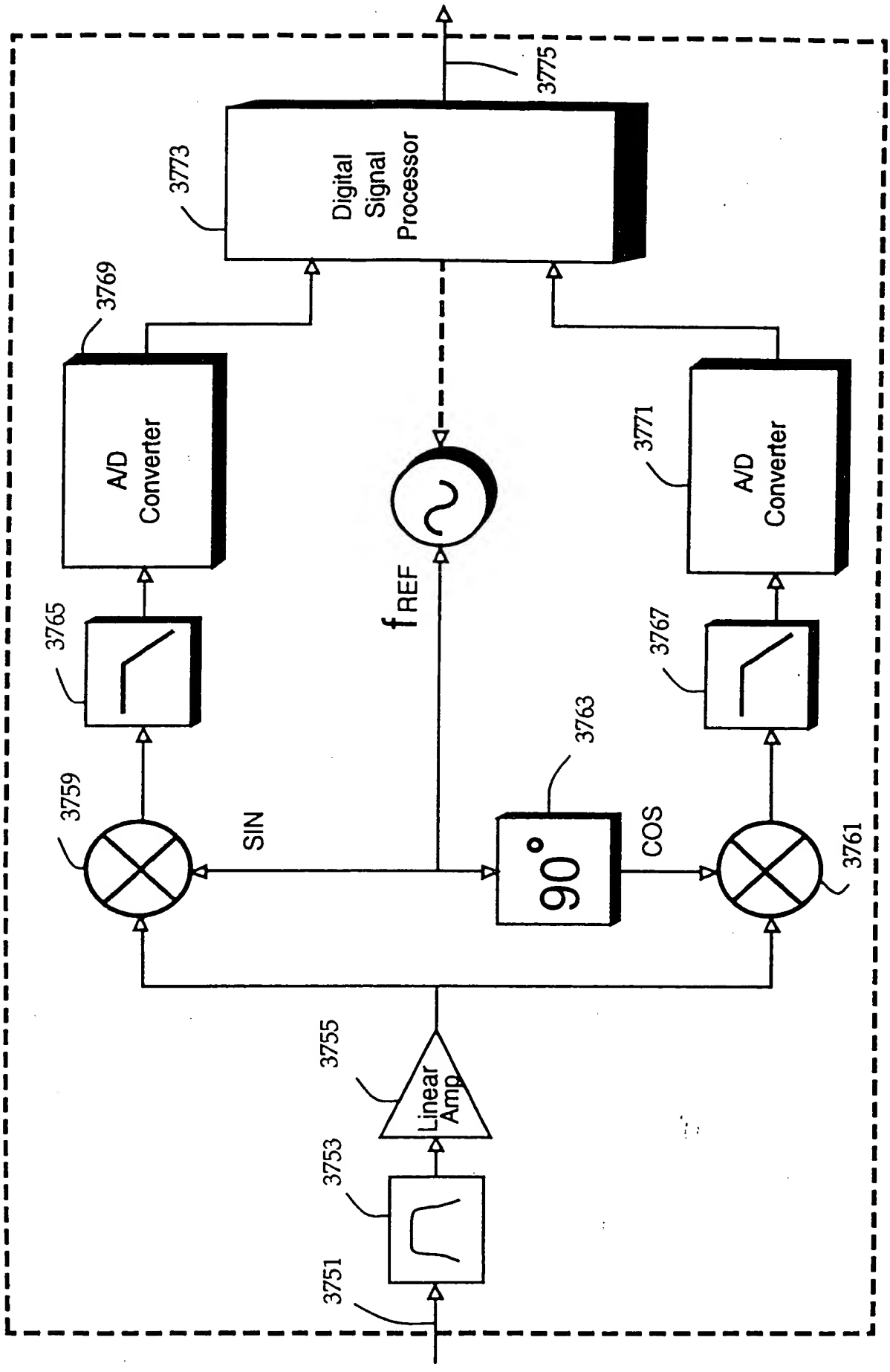

3775
Digital Signal Processor
3773
3769
A/D Converter
3771
A/D Converter
f_{REF}
3765
3767
3763
3759
SIN
90°
COS
3761
3755
Linear Amp
3753
3751

Figure 41

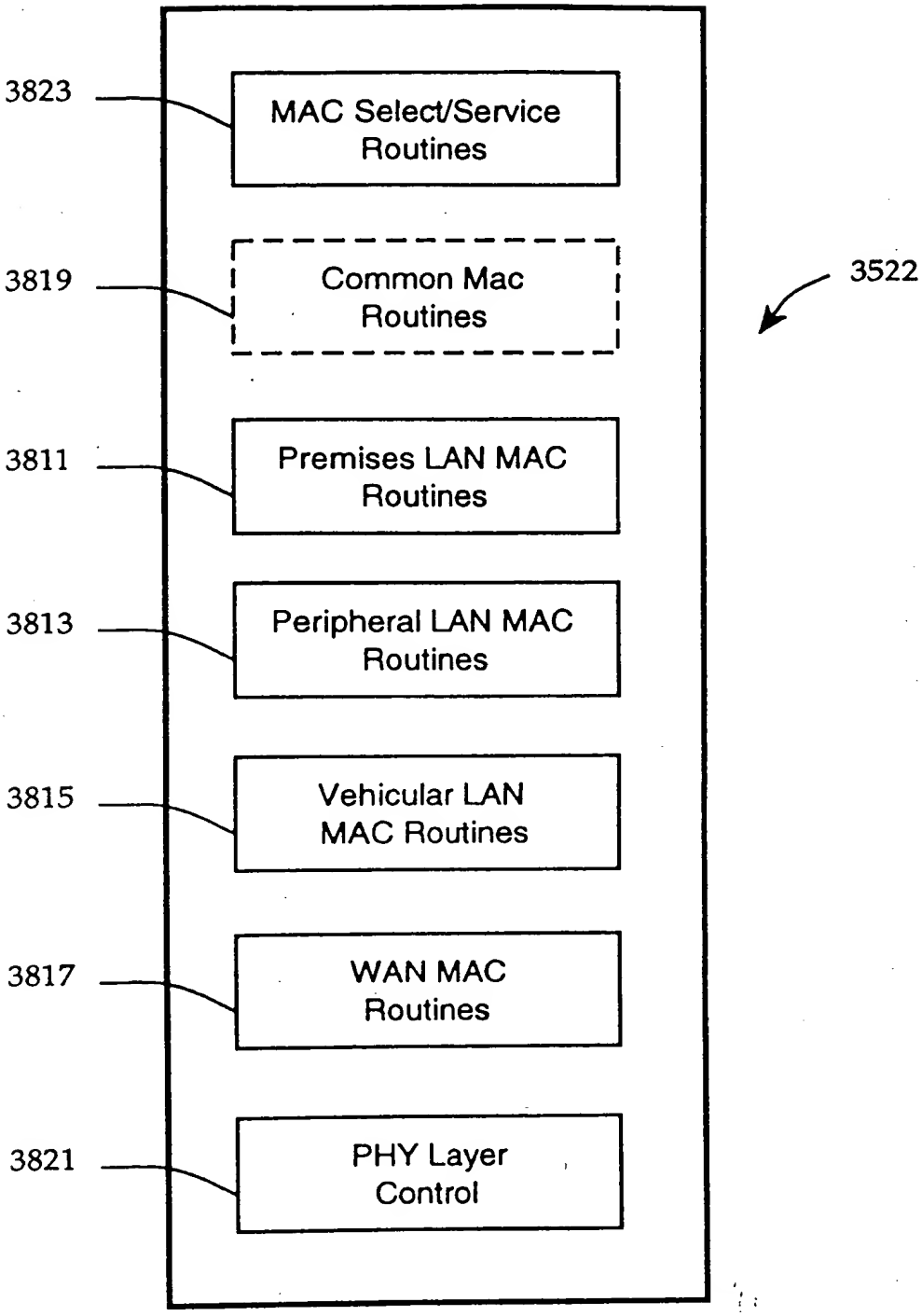

3823
MAC Select/Service Routines
3819
Common Mac Routines
3522
3811
Premises LAN MAC Routines
3813
Peripheral LAN MAC Routines
3815
Vehicular LAN MAC Routines
3817
WAN MAC Routines
3821
PHY Layer Control

Figure 42

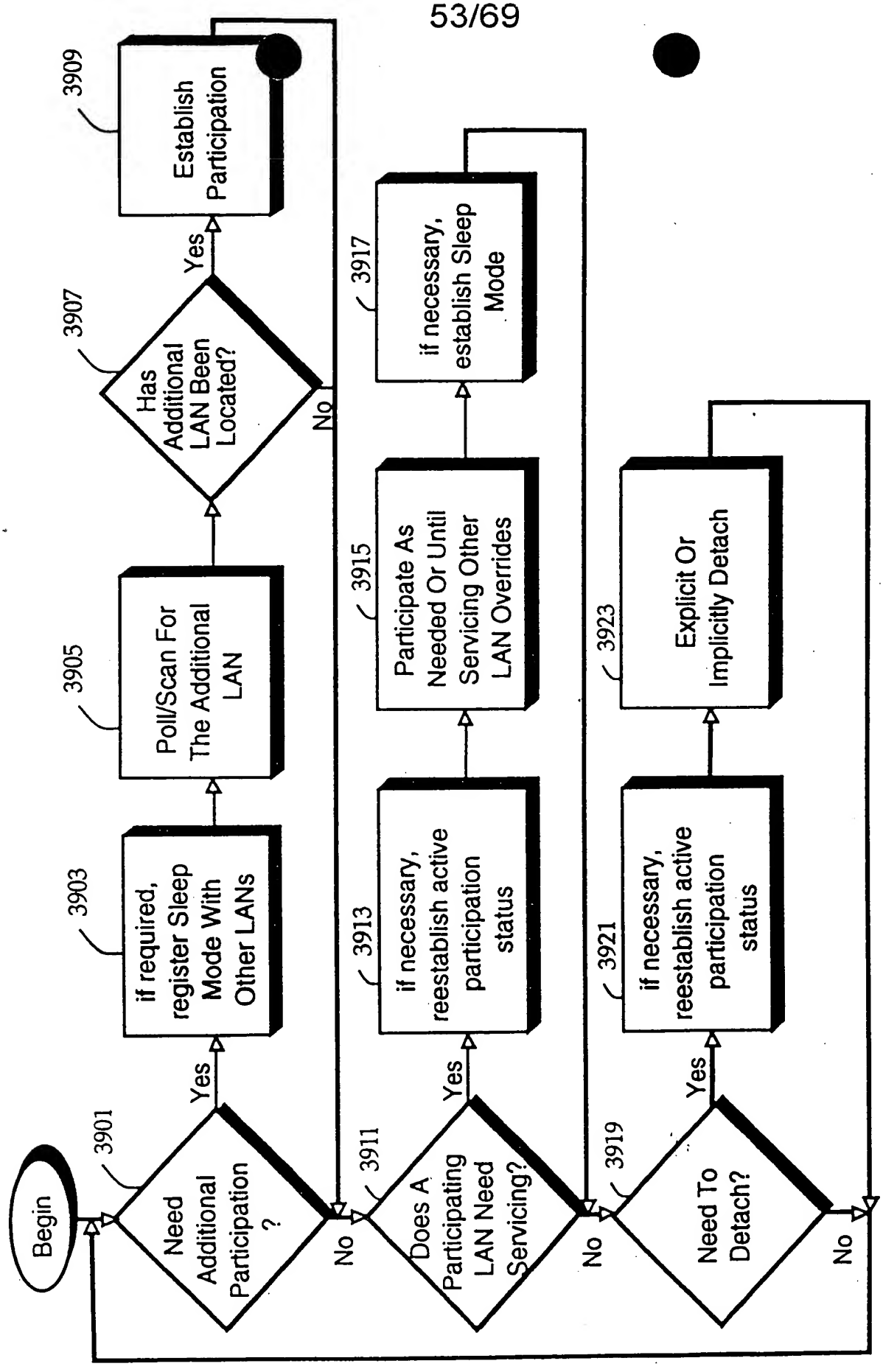

Begin
3901
Need Additional Participation ?
Yes
3903
if required, register Sleep Mode With Other LANs
3905
Poll/Scan For The Additional LAN
3907
Has Additional LAN Been Located?
Yes
3909
Establish Participation
No
No
3911
Does A Participating LAN Need Servicing?
Yes
3913
if necessary, reestablish active participation status
3915
Participate As Needed Or Until Servicing Other LAN Overrides
3917
if necessary, establish Sleep Mode
No
3919
Need To Detach?
Yes
3921
if necessary, reestablish active participation status
3923
Explicit Or Implicitly Detach
No

Figure 43

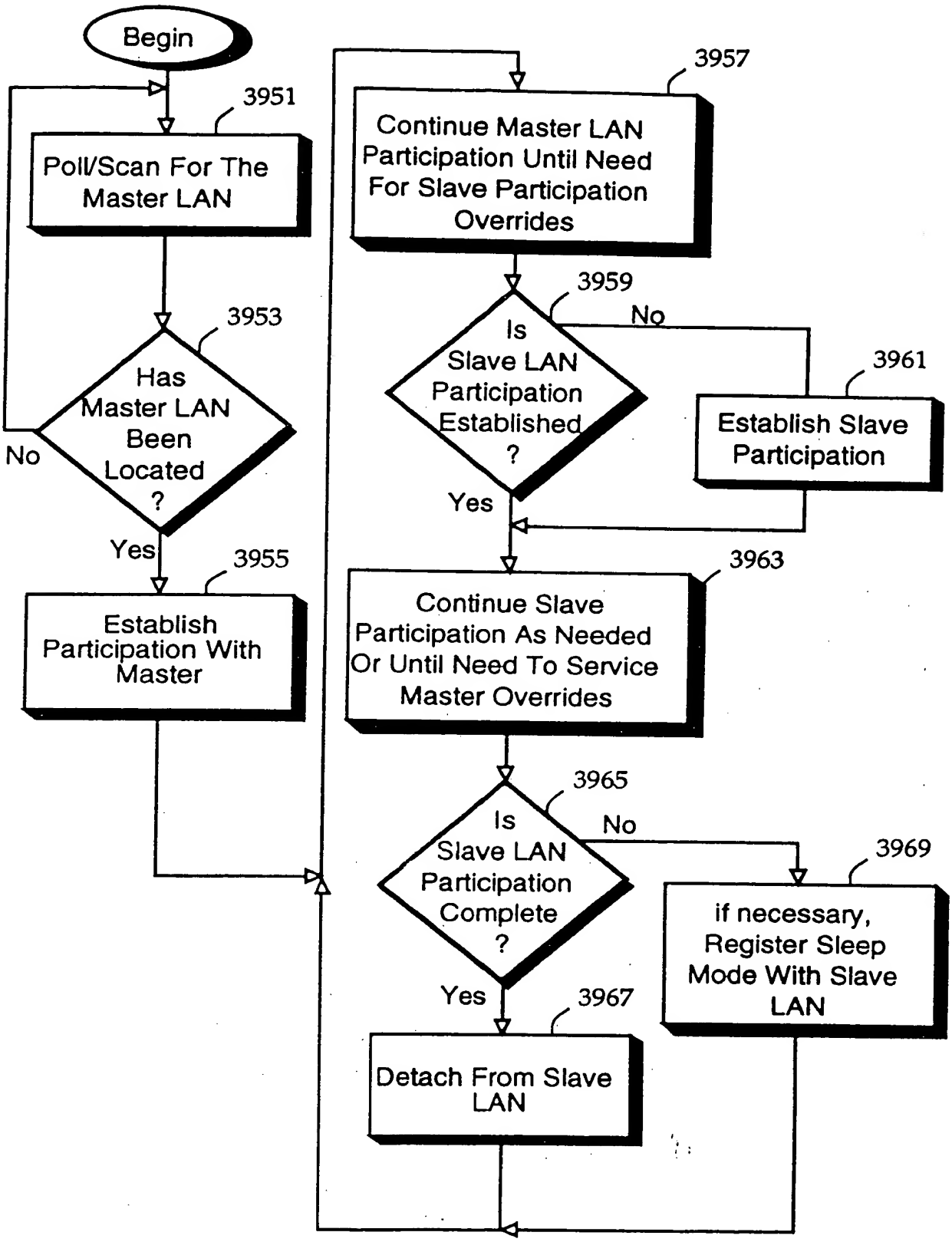

Begin
3951
Poll/Scan For The Master LAN
3953
Has Master LAN Been Located ?
No
Yes
3955
Establish Participation With Master
3957
Continue Master LAN Participation Until Need For Slave Participation Overrides
3959
Is Slave LAN Participation Established ?
No
3961
Establish Slave Participation
Yes
3963
Continue Slave Participation As Needed Or Until Need To Service Master Overrides
3965
Is Slave LAN Participation Complete ?
No
3969
if necessary, Register Sleep Mode With Slave LAN
Yes
3967
Detach From Slave LAN

Figure 44

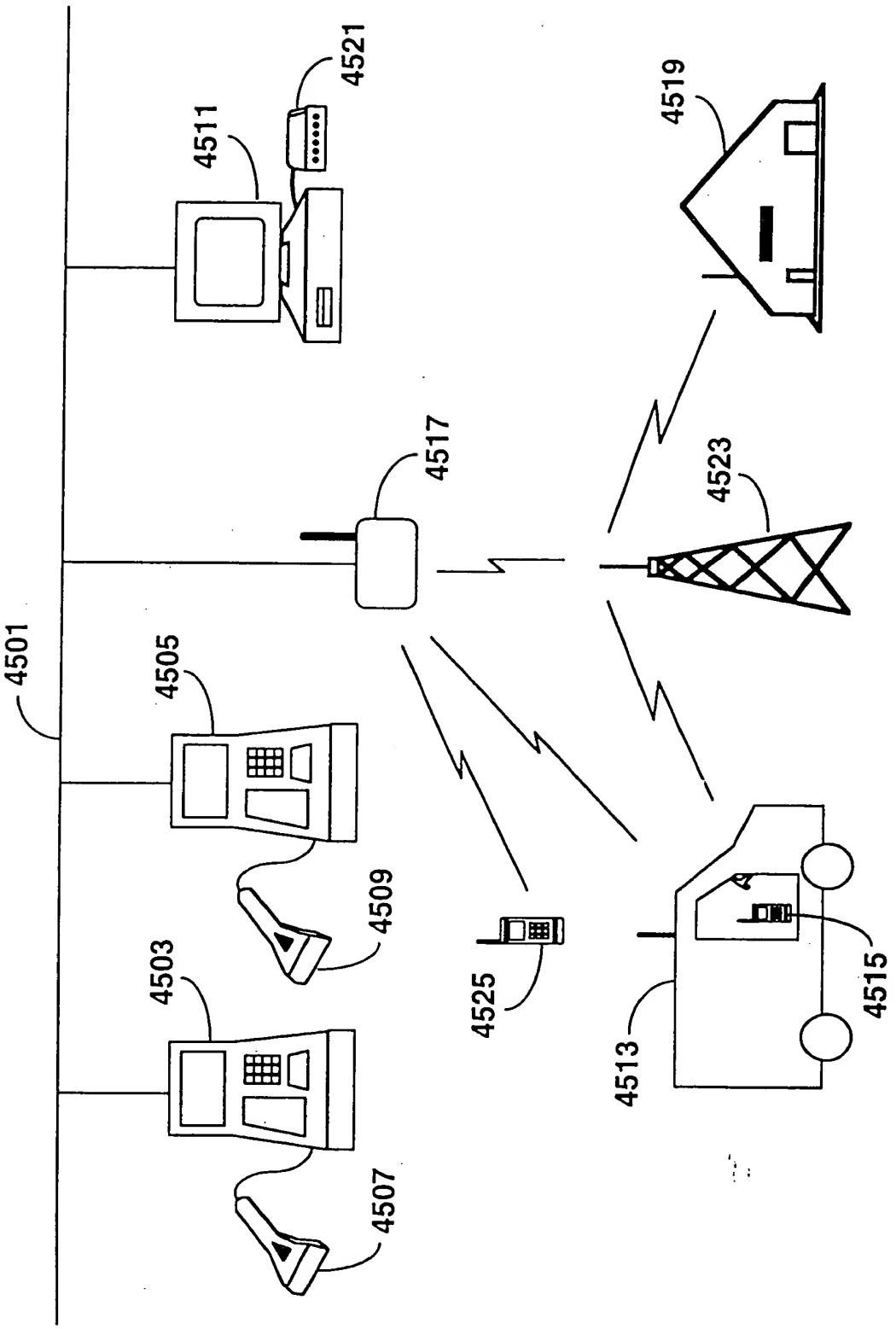

4501
4503
4505
4507
4509
4511
4513
4515
4517
4519
4521
4523
4525

Fig. 45

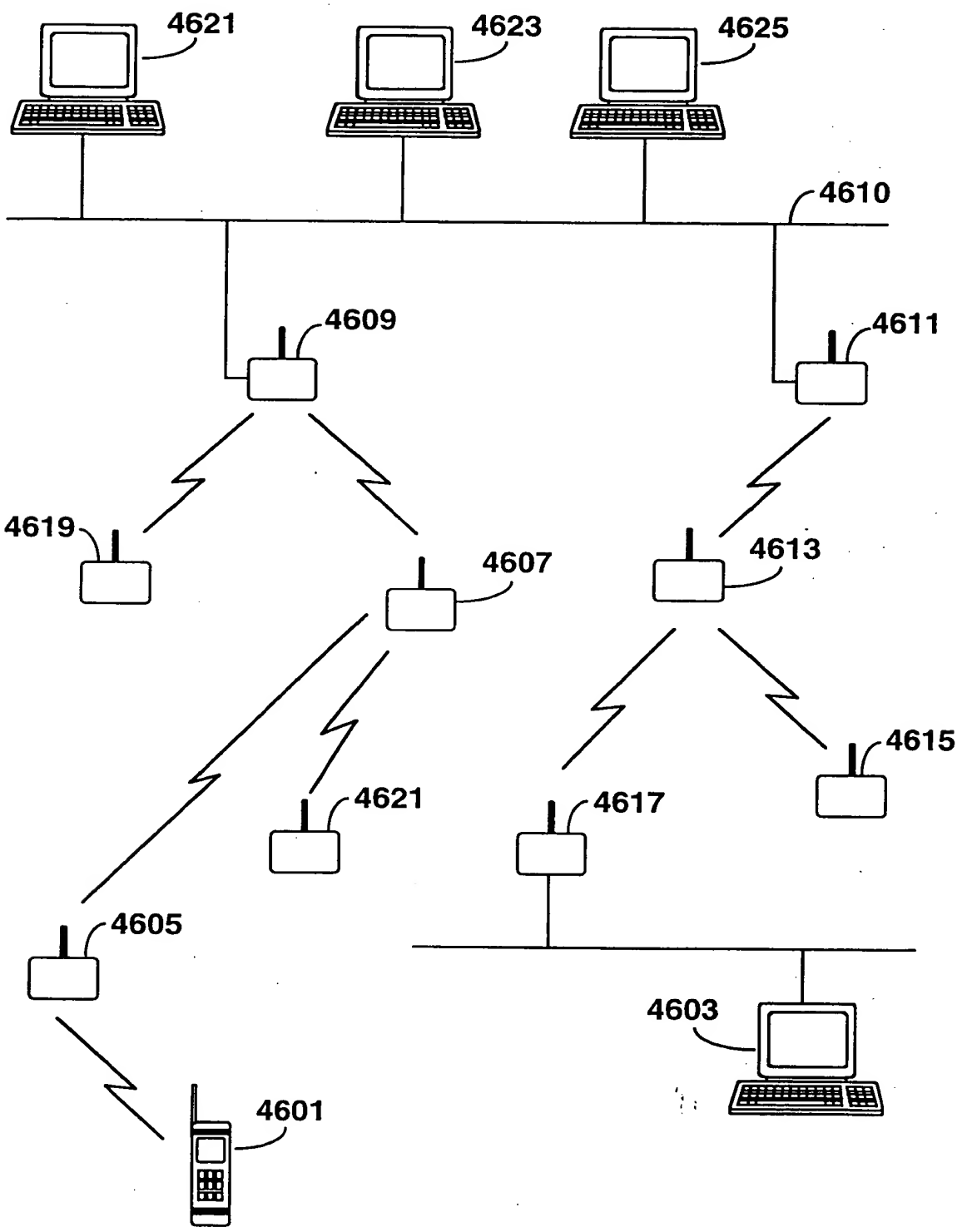

4621
4623
4625
4610
4609
4611
4619
4607
4613
4615
4621
4617
4605
4603
4601

Fig. 46a

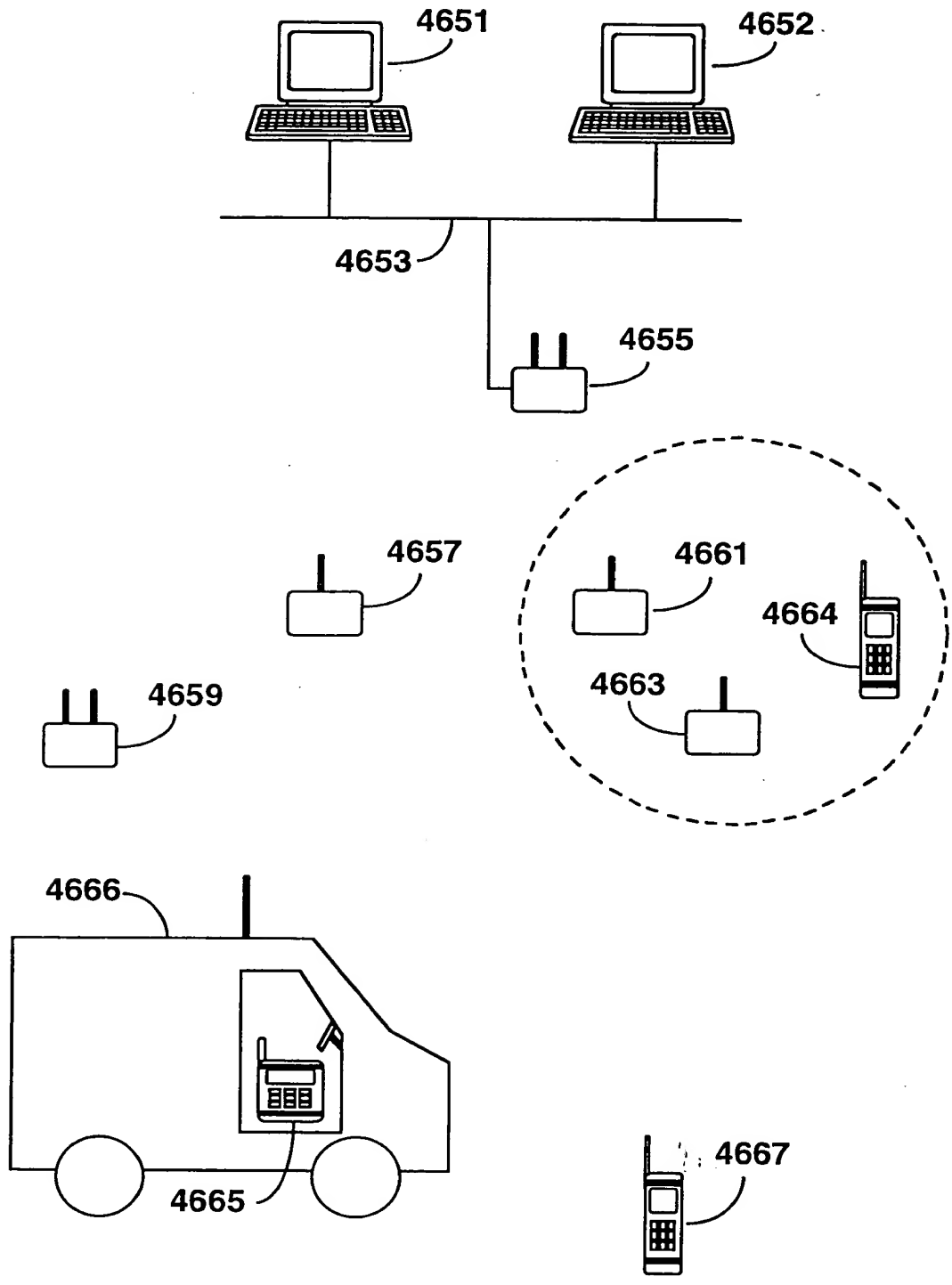


Fig. 46b

09/12/2004 08:48:08 PM

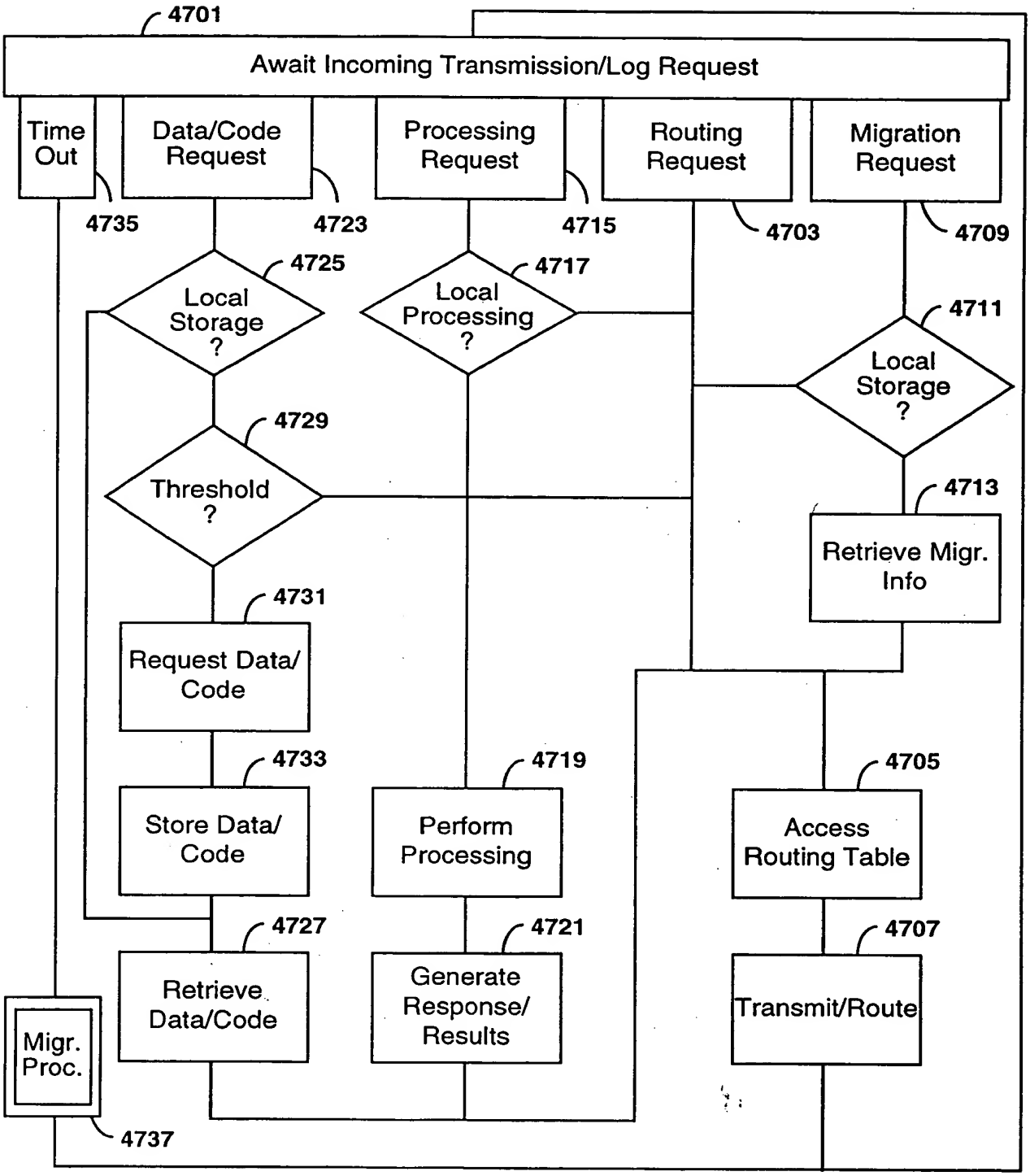

4701
Await Incoming Transmission/Log Request
Time Out
Data/Code Request
Processing Request
Routing Request
Migration Request
4735
4723
4715
4703
4709
4725
Local Storage ?
4717
Local Processing ?
4711
Local Storage ?
4729
Threshold ?
4713
Retrieve Migr. Info
4731
Request Data/ Code
4733
Store Data/ Code
4719
Perform Processing
4705
Access Routing Table
4727
Retrieve Data/Code
4721
Generate Response/ Results
4707
Transmit/Route
Migr. Proc.
4737

Fig. 47a

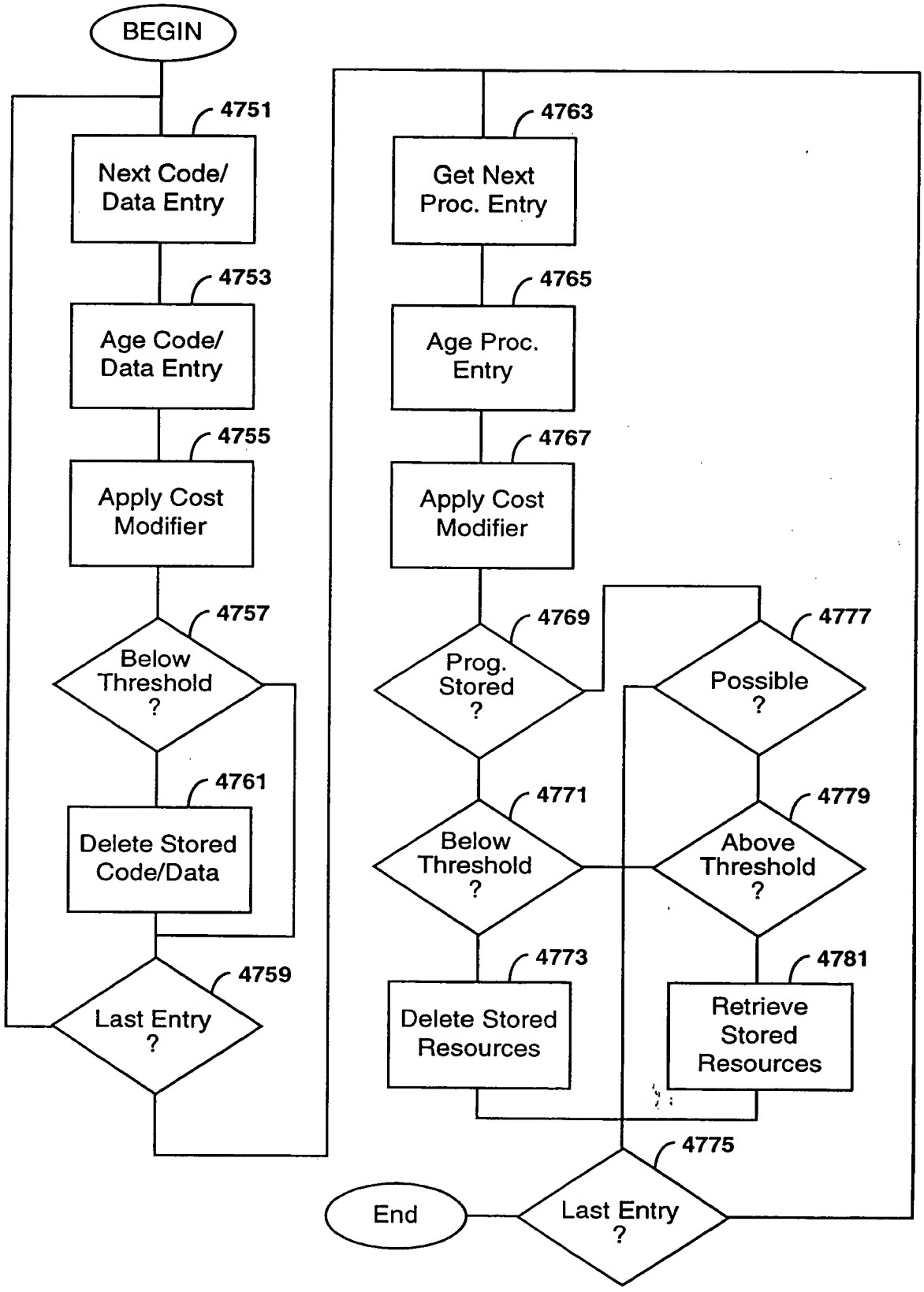


Fig. 47b

09/2948 "86+080"

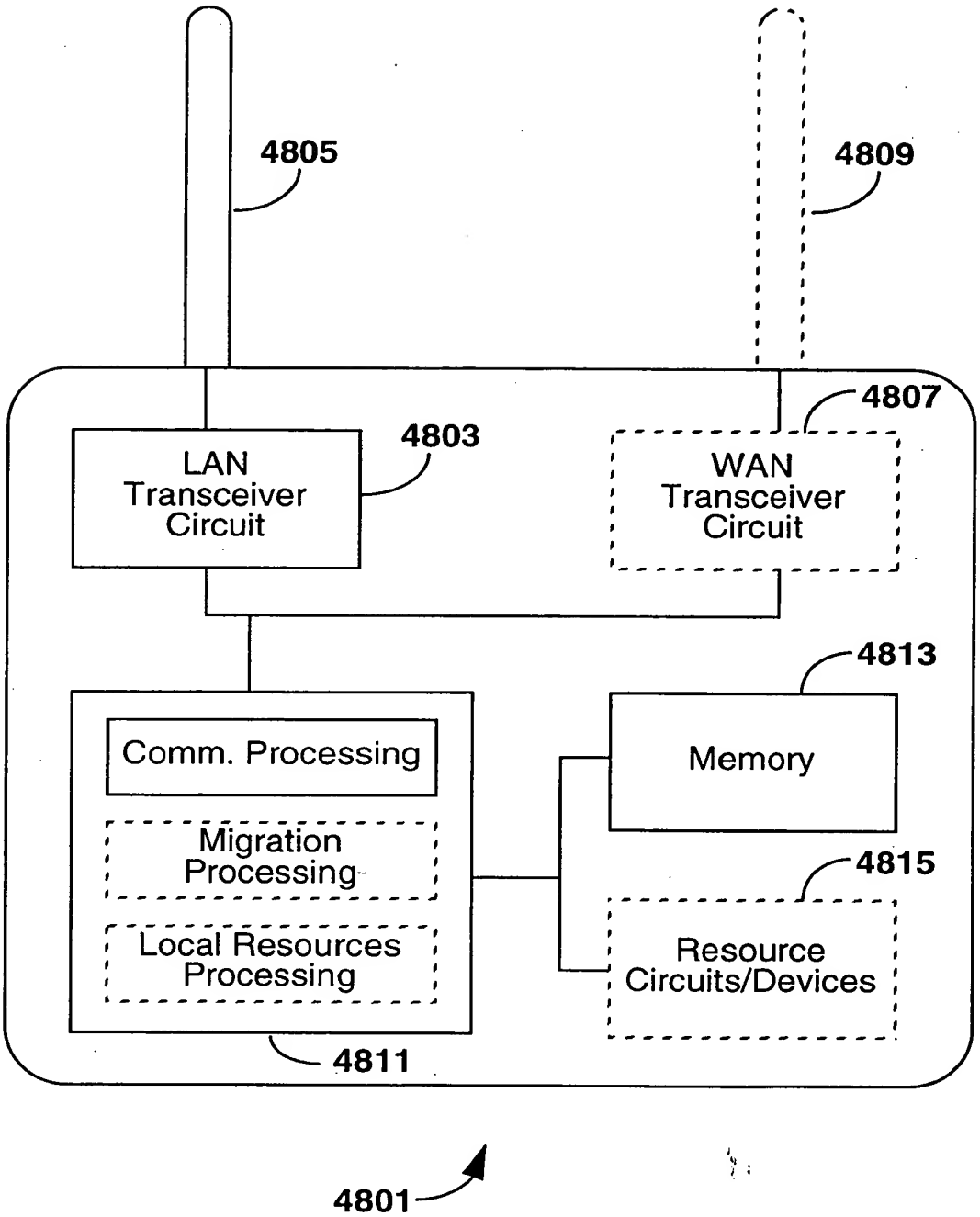

4805
4809
4807
4803
LAN
Transceiver
Circuit
WAN
Transceiver
Circuit
4813
Comm. Processing
Memory
Migration
Processing
4815
Local Resources
Processing
Resource
Circuits/Devices
4811
4801

Fig. 48

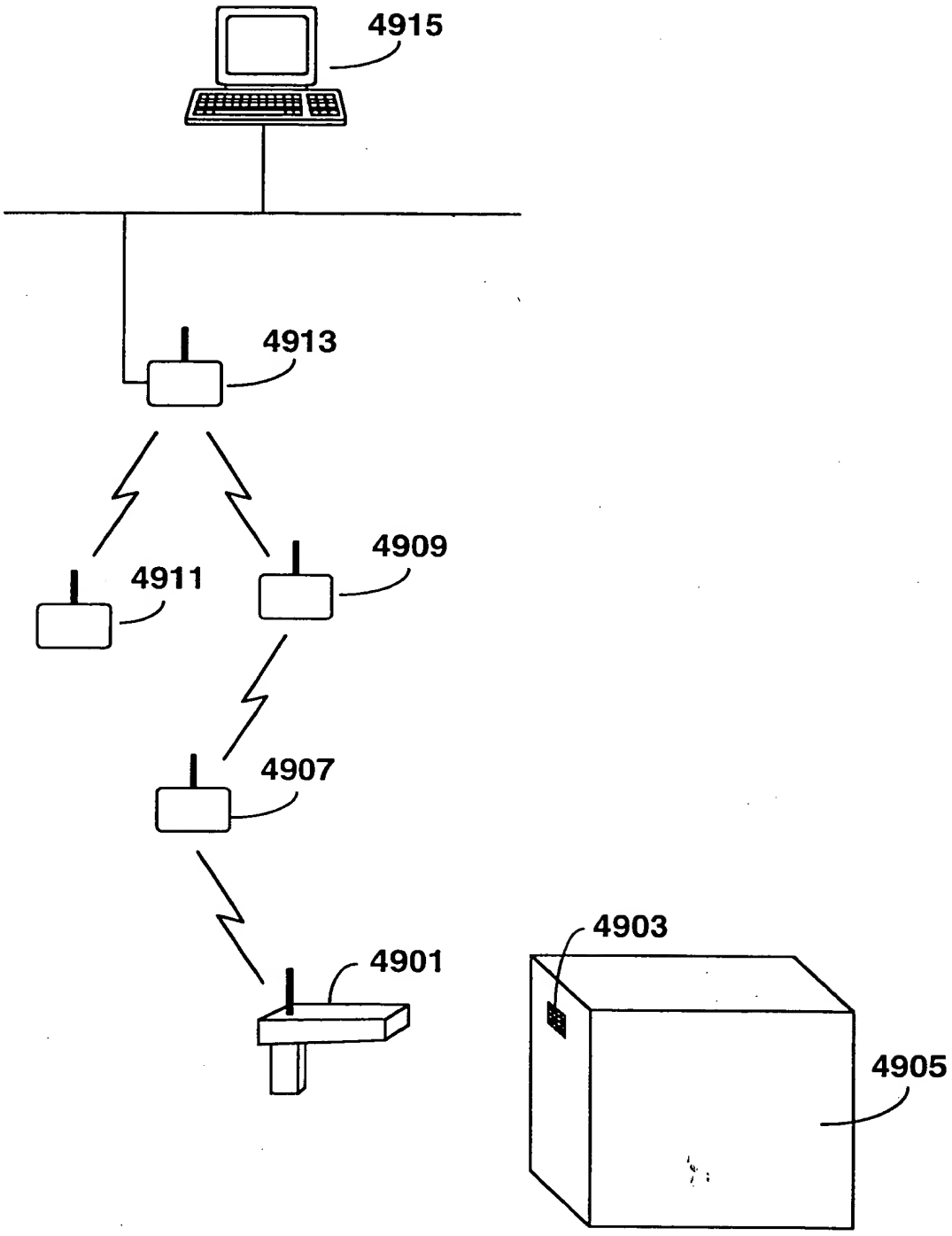


Fig. 49a

SUBSTITUTE SHEET (RULE 26)

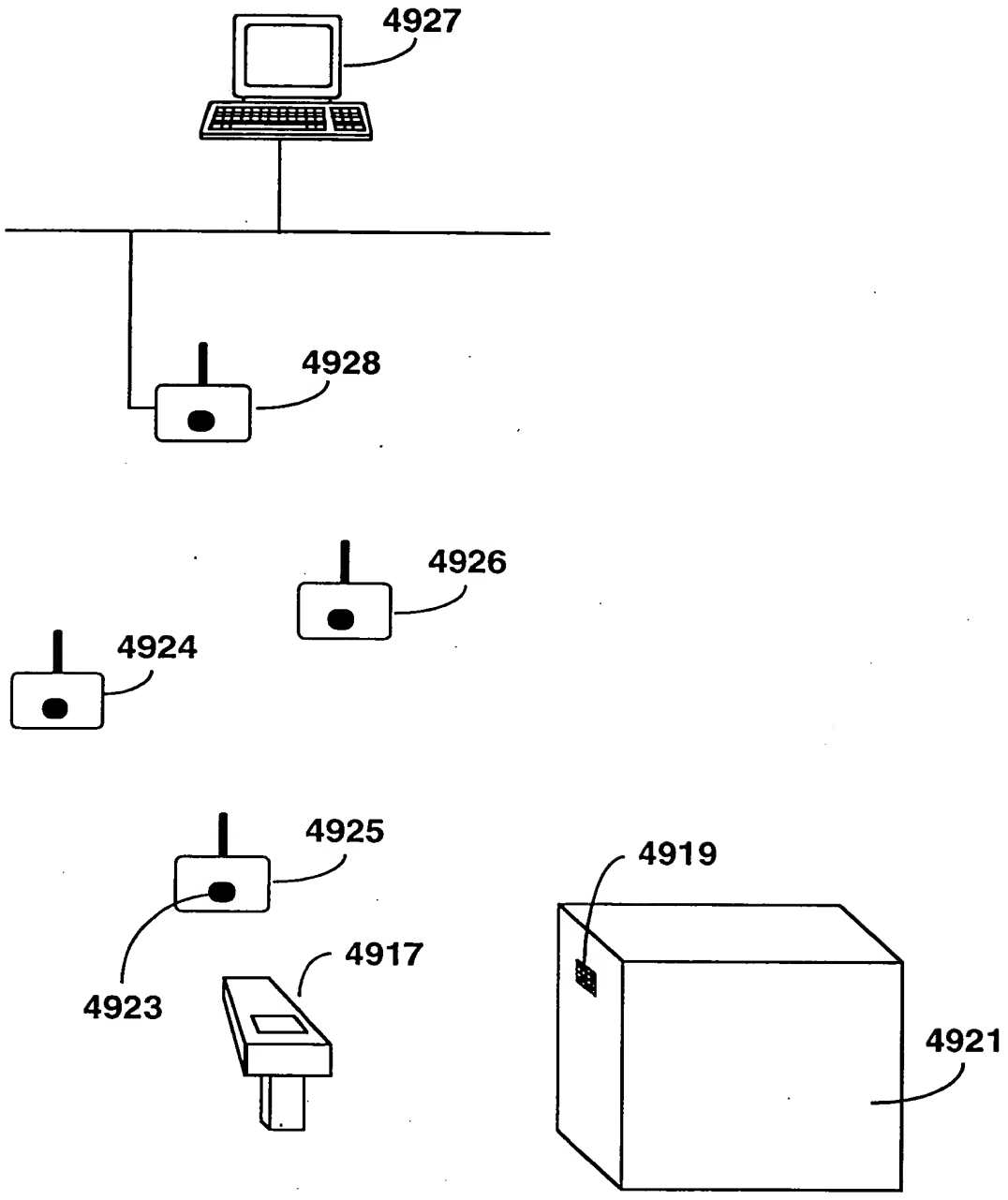


Fig. 49b

08748295.080198

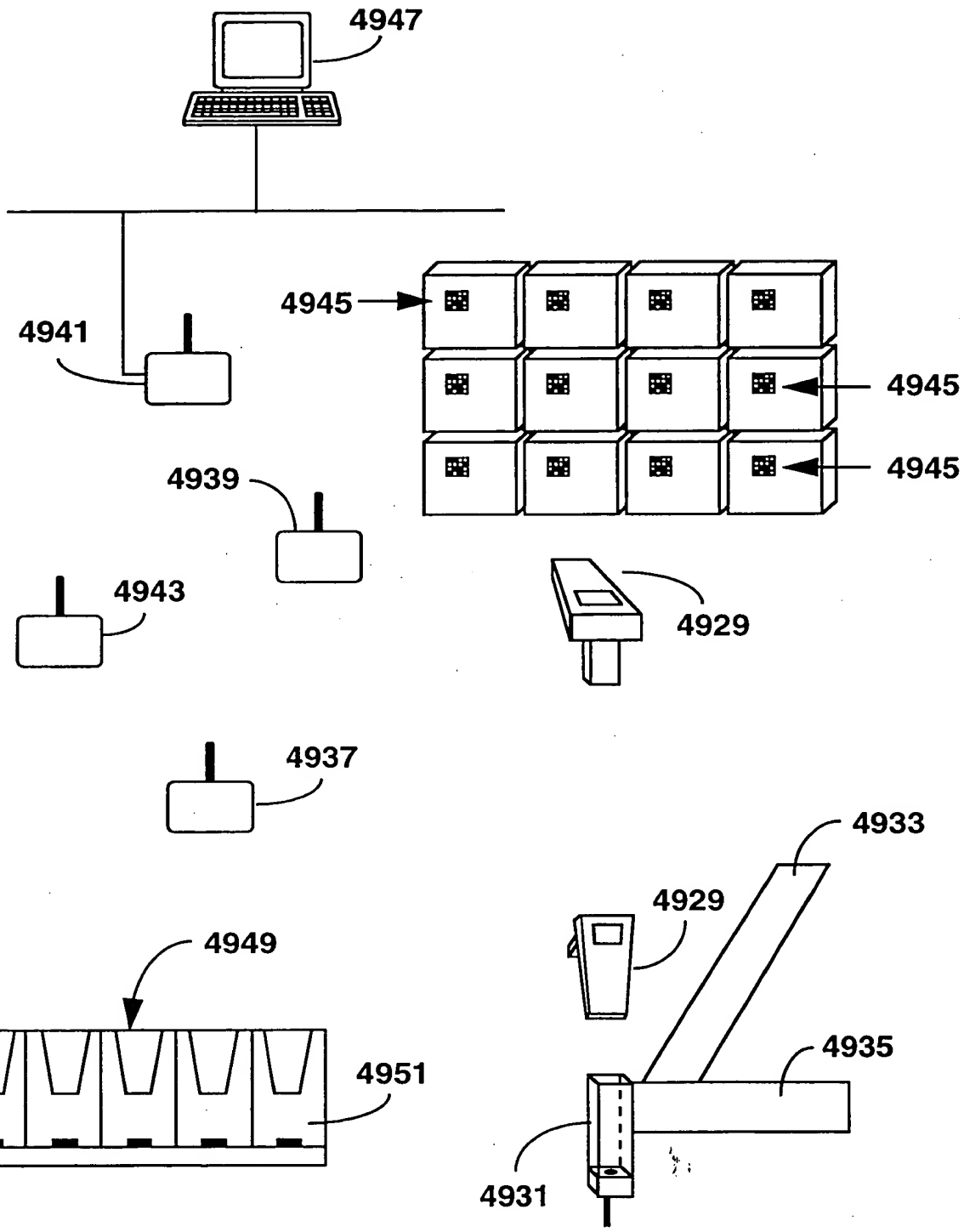

4947
4941
4945
4945
4945
4939
4943
4929
4937
4933
4929
4949
4935
4951
4931

Fig. 49c

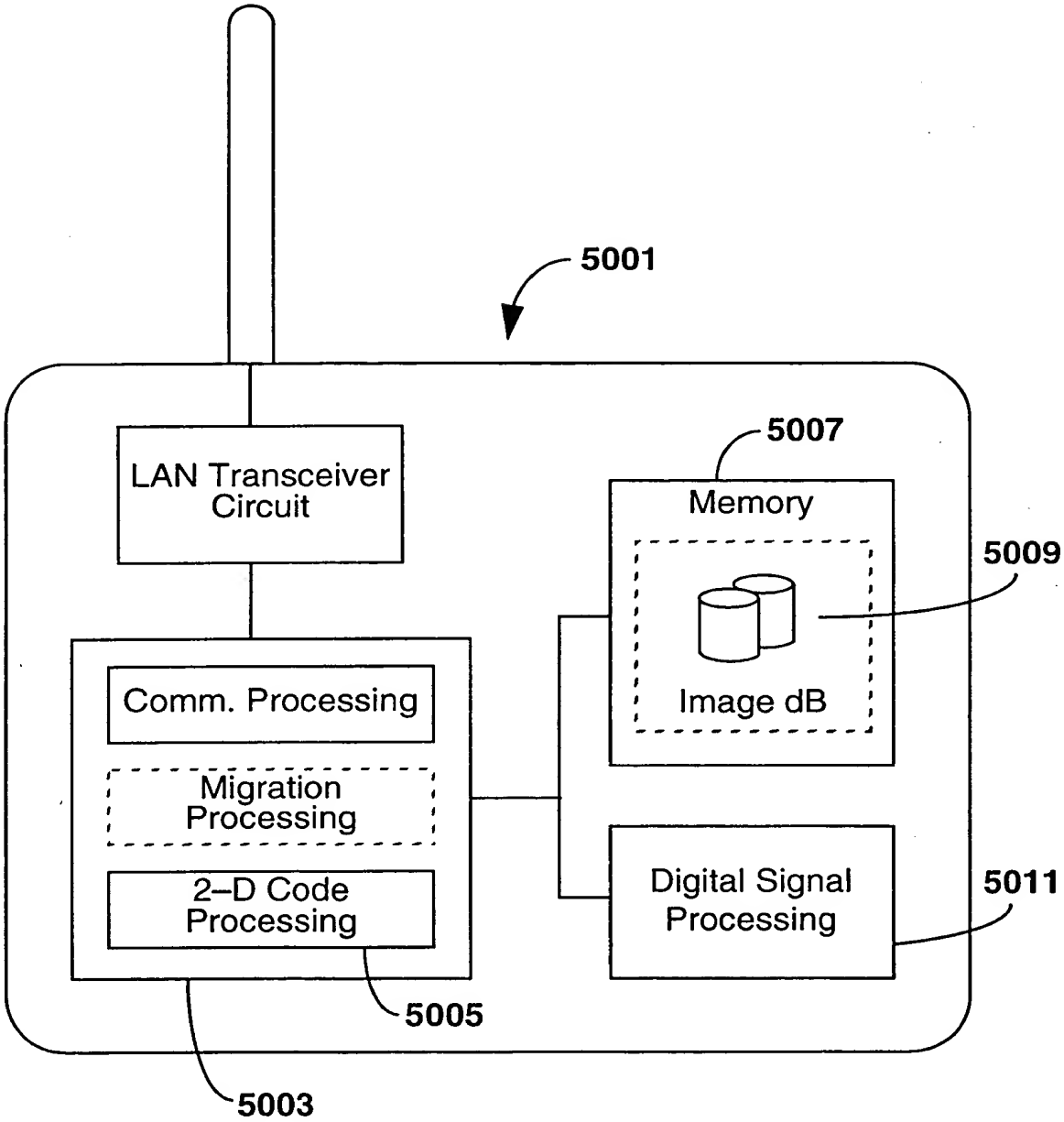

5001
LAN Transceiver Circuit
5007
Memory
5009
Image dB
Comm. Processing
Migration Processing
2–D Code Processing
Digital Signal Processing
5011
5005
5003

Fig. 50

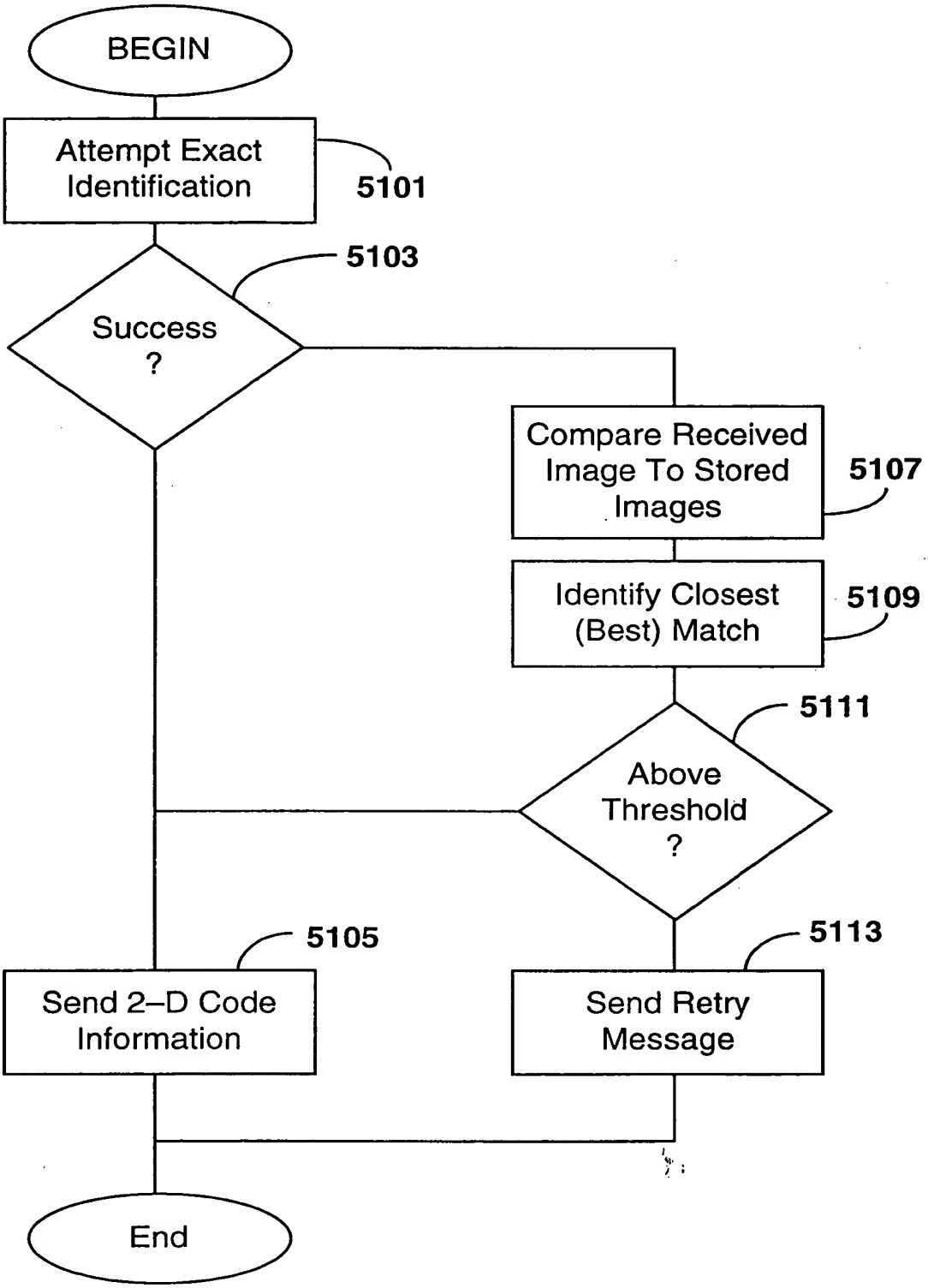

BEGIN
Attempt Exact Identification
5101
5103
Success ?
Compare Received Image To Stored Images
5107
Identify Closest (Best) Match
5109
5111
Above Threshold ?
5105
Send 2–D Code Information
5113
Send Retry Message
End

Fig. 51a

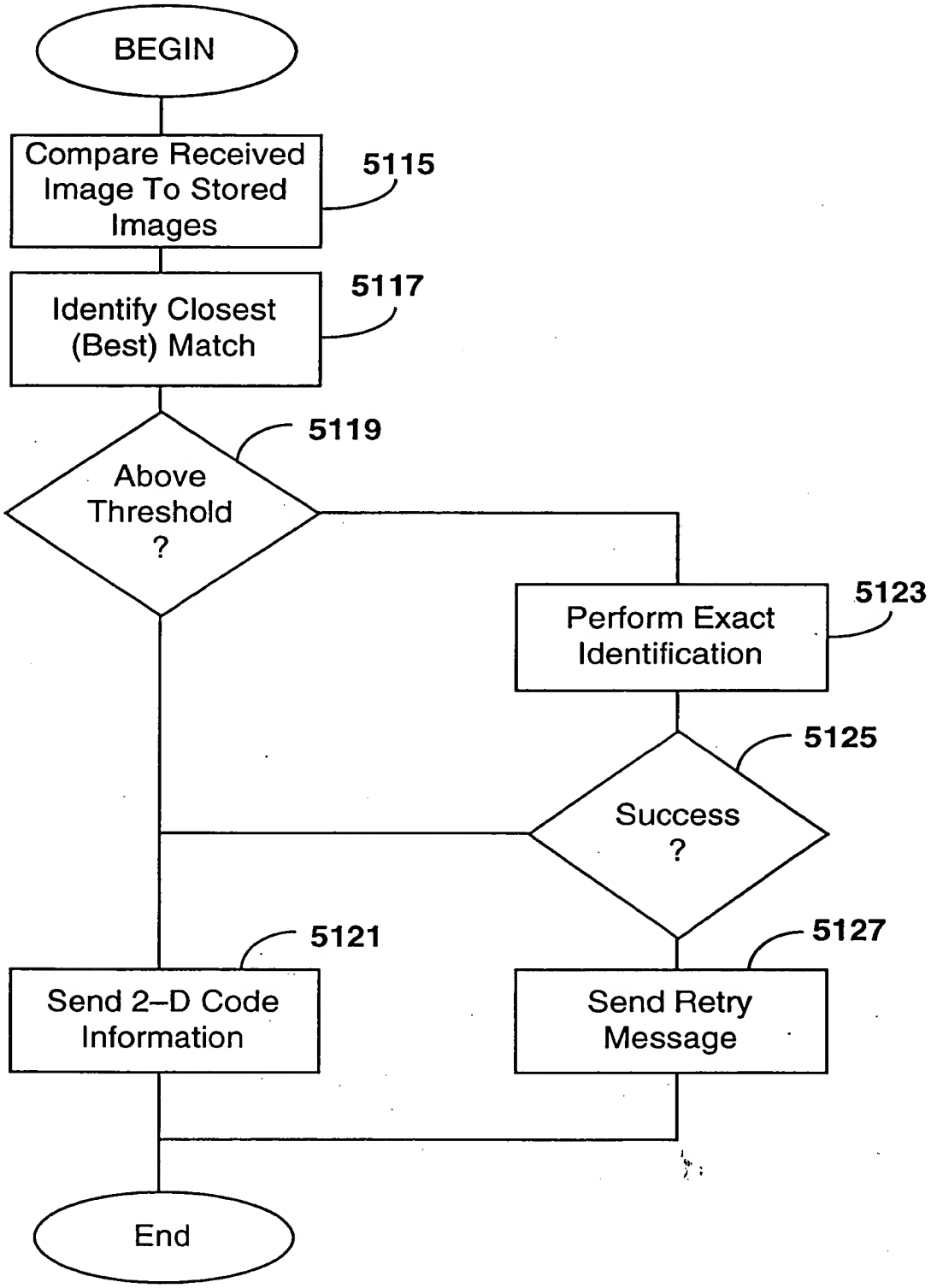

BEGIN
Compare Received Image To Stored Images
5115
Identify Closest (Best) Match
5117
Above Threshold ?
5119
Perform Exact Identification
5123
Success ?
5125
Send 2–D Code Information
5121
Send Retry Message
5127
End

Fig. 51b

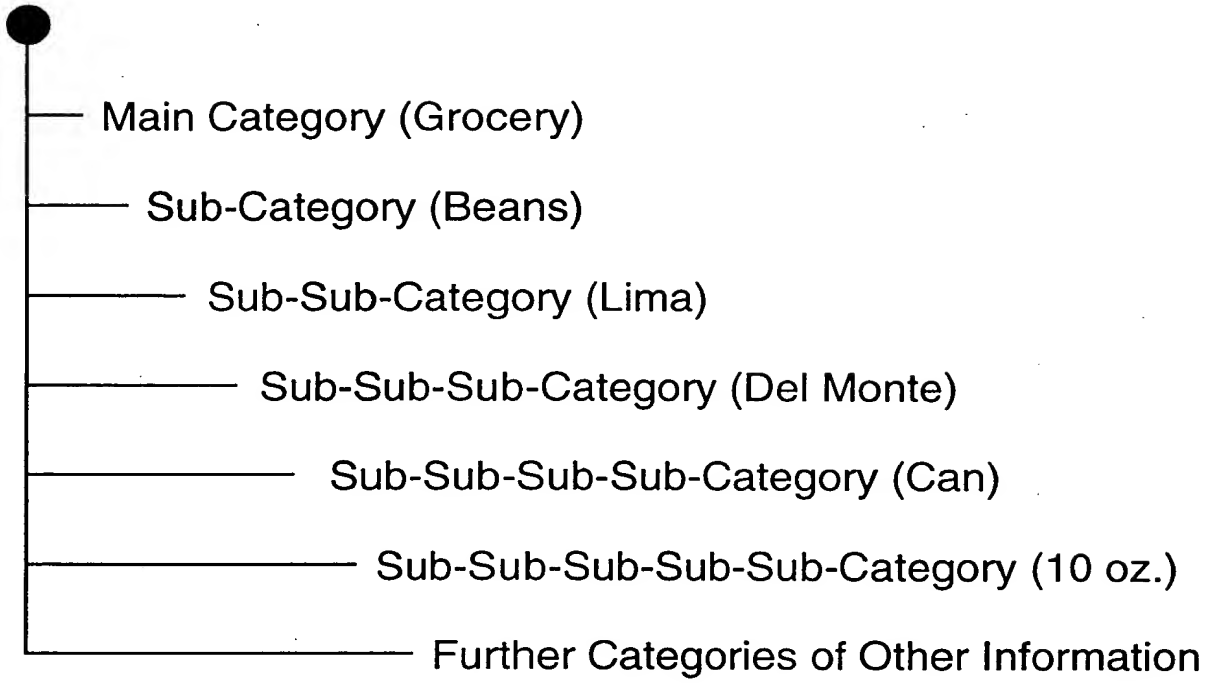

Main Category (Grocery)
Sub-Category (Beans)
Sub-Sub-Category (Lima)
Sub-Sub-Sub-Category (Del Monte)
Sub-Sub-Sub-Sub-Category (Can)
Sub-Sub-Sub-Sub-Sub-Category (10 oz.)
Further Categories of Other Information

Fig. 52

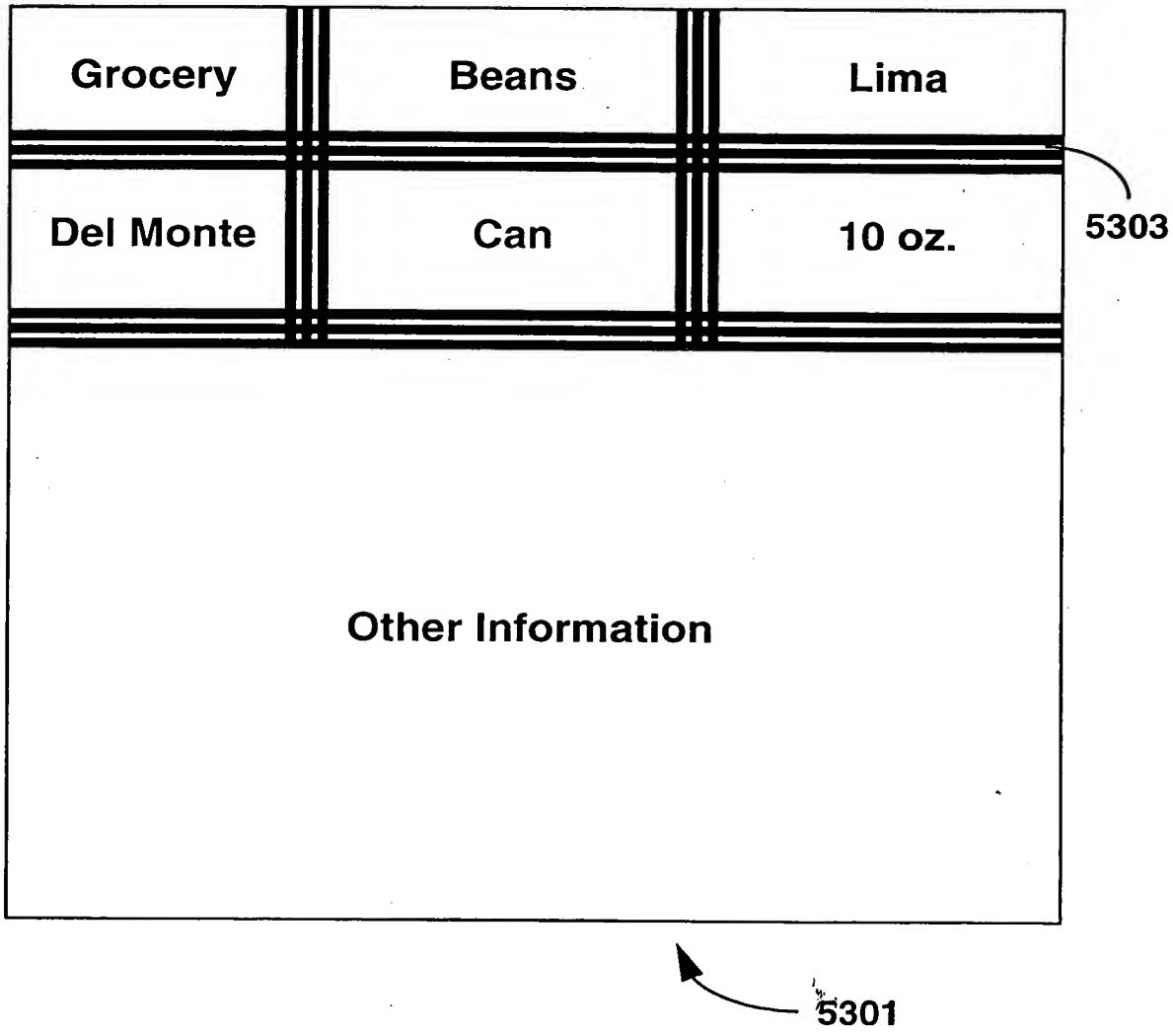

Grocery
Beans
Lima
Del Monte
Can
10 oz.
5303
Other Information
5301

Fig. 53

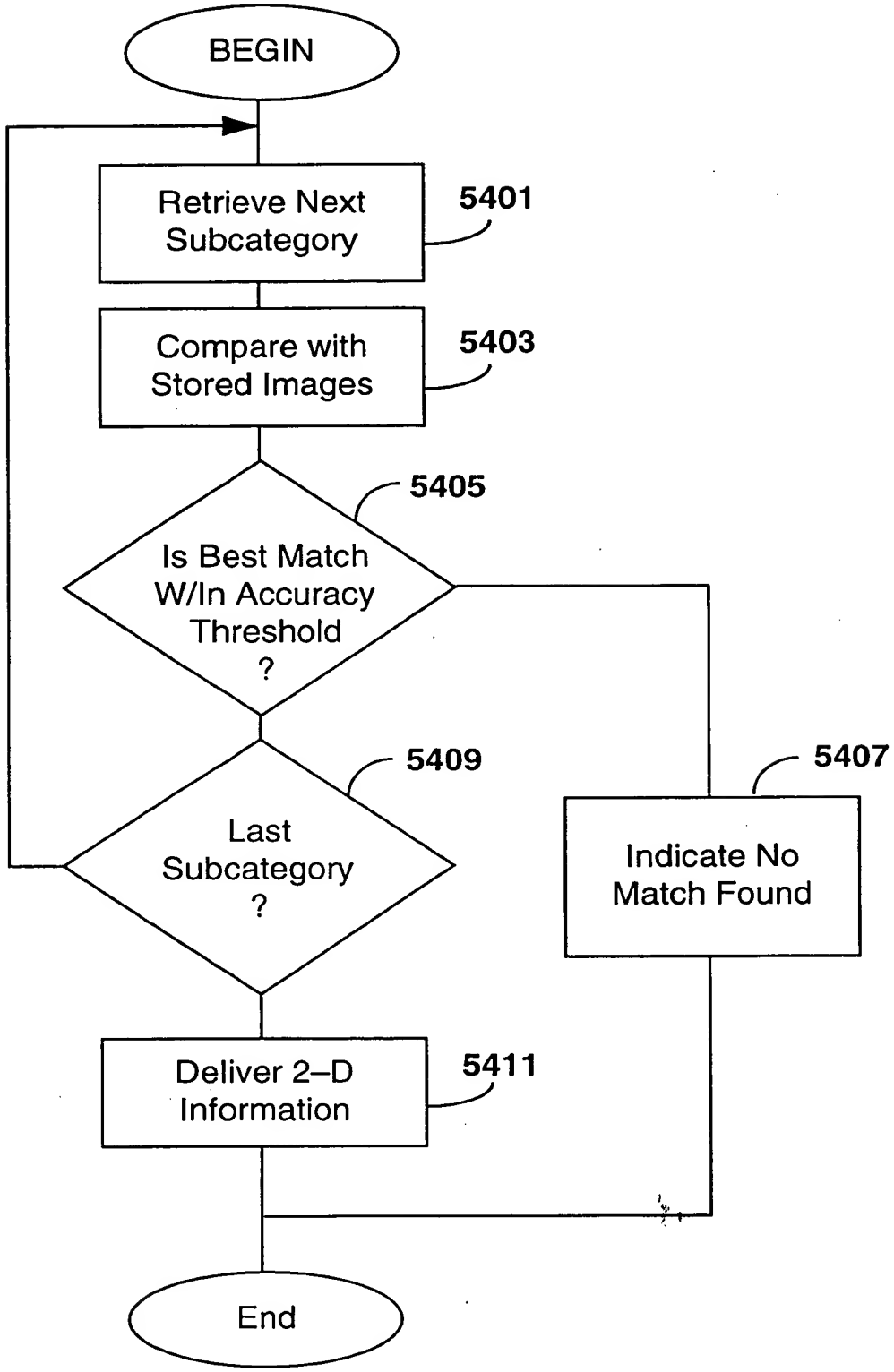


Fig. 54

8674080 - 8th 2nd 1st 0